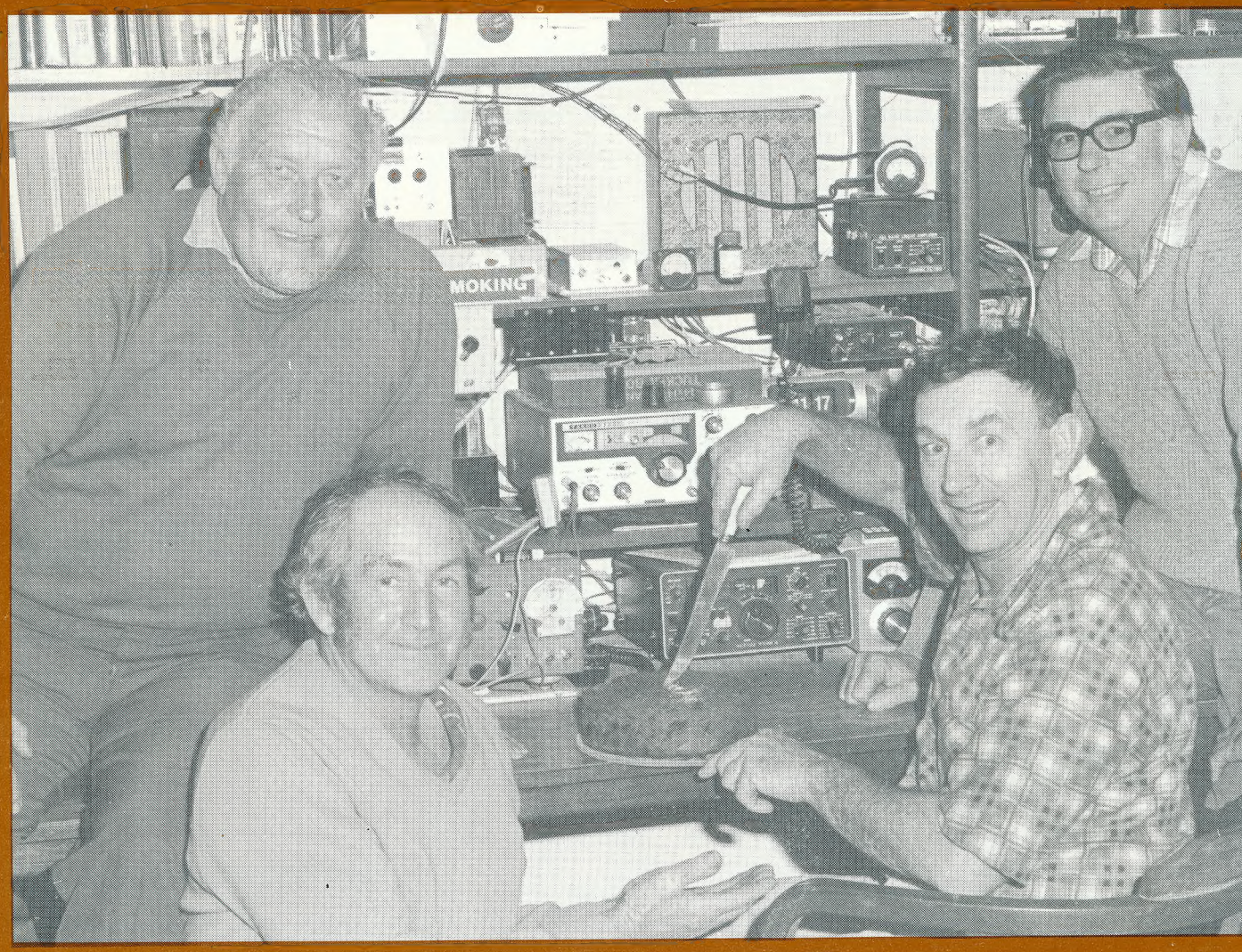
amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 49, No. 1 JANUARY 1981

FEATURED IN THIS ISSUE:

- ★ A NEW FREQUENCY COUNTER
- ★ A SOLID STATE KEYBOARD FOR RTTY
- ★ HOME BUILDING
- ★ MORE WORLD-WIDE COMMUNICATIONS WITH HAND-HELD TRANSCEIVERS

Registered for posting as a Publication — Category B

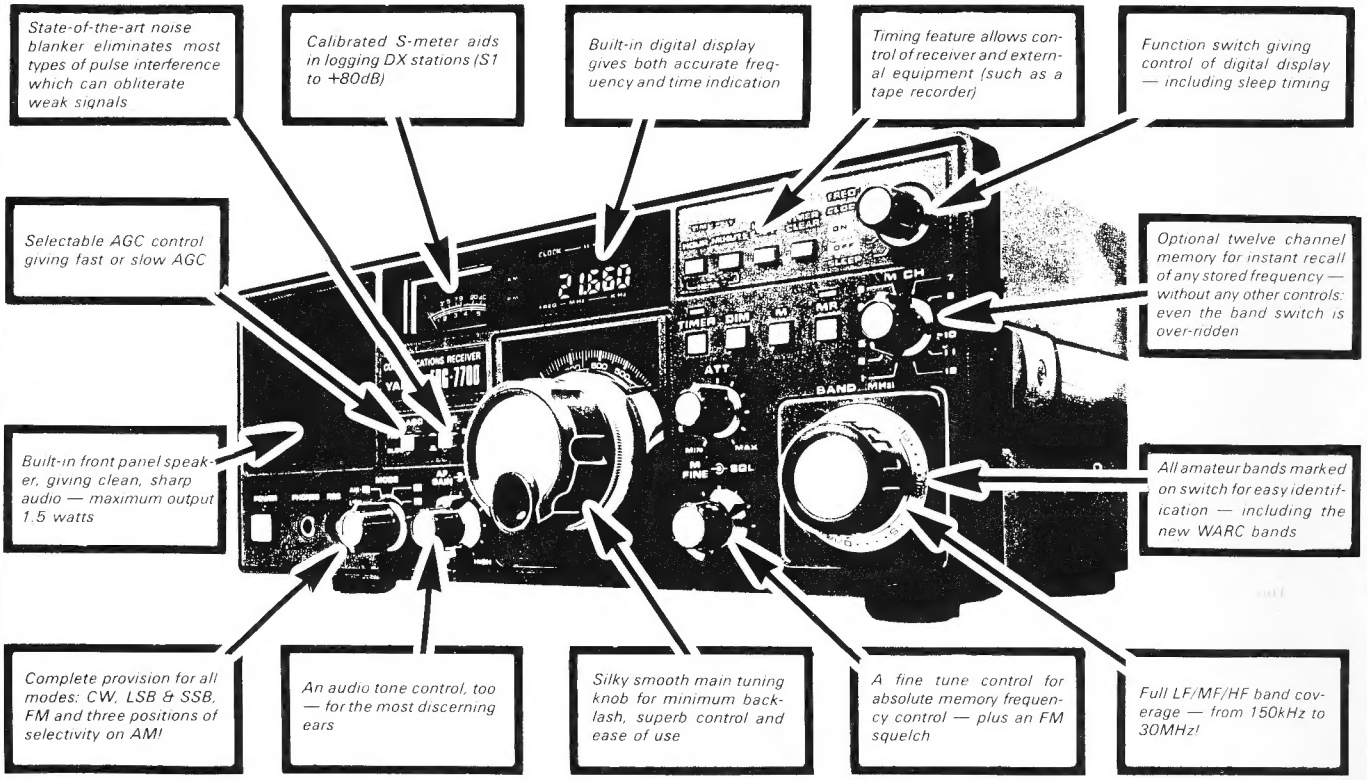
WIN A TRIP TO HONG KONG CONTEST
BUY NOW AND ENTER!

~~FRG-7 FRG-7000~~

NOW IT'S THE BRAND NEW

FRG-7700

We've sold thousands of the superb Yaesu 'FRG's. Now there's a brand new model: the superb FRG-7700 . . . All mode (even FM) and a brilliant new design. Isn't it time you up-dated your communications receiver (FM is great with converters!)


State-of-the-art noise blanker eliminates most types of pulse interference which can obliterate weak signals
Calibrated S-meter aids in logging DX stations (S1 to +80dB)
Built-in digital display gives both accurate frequency and time indication
Timing feature allows control of receiver and external equipment (such as a tape recorder)
Function switch giving control of digital display — including sleep timing
Selectable AGC control giving fast or slow AGC
Optional twelve channel memory for instant recall of any stored frequency — without any other controls: even the band switch is over-ridden
Built-in front panel speaker, giving clean, sharp audio — maximum output 1.5 watts
All amateur bands marked on switch for easy identification — including the new WARC bands
Complete provision for all modes: CW, LSB & SSB, FM and three positions of selectivity on AM!
An audio tone control, too — for the most discerning ears
Silky smooth main tuning knob for minimum backlash, superb control and ease of use
A fine tune control for absolute memory frequency control — plus an FM squelch
Full LF/MF/HF band coverage — from 150kHz to 30MHz!

Of course, the front panel is only half the story.
Take a look inside the new Yaesu FRG-7700 and you'll find a superb state-of-the-art circuit, giving you outstanding performance and ease of use.
And the really good news: the FRG-7700 is actually cheaper than the model it replaces.
A better receiver for less money!
And with the optional memory unit, the FRG-7700 gives you the ability to store up to 12 commonly used frequencies — recalled at the touch of a button! (It even holds them when the unit is turned off!)
The all-mode Yaesu FRG-7700 is the receiver for the 80's — a worthy successor to the world famous FRG-7 & 7000.

YAESU FRG-7700 RECEIVER

Cat. D-2840
P&P $5.50

$525

Terms available from $55 dep & 25.74 mth (24 months)

OPTIONAL 12 CHANNEL MEMORY UNIT Cat. D-2842 $145.00. P&P FREE IF PURCHASED WITH ABOVE UNIT

DICK SMITH ELECTRONICS

NSW	145 Parramatta Rd	AUBURN	648 0558
	613 Princes Hwy	BLAKEHURST	546 7744
	818 George St	BROADWAY	211 3777
	531 Pittwater Rd	BROOKVALE	93 0441
	147 Hume Hwy	CHULLORA	642 8922
	162 Pacific Hwy	GORE HILL	439 5311
	30 Grose Street	PARRAMATTA	683 1133
	125 York Street	SYDNEY	290 3377
	263 Keira Street	WOLLONGONG	28 3800
ACT	96 Gladstone St	FYSHWICK	80 4944
QLD	166 Logan Road	BURANDA	391 6233
	824 Gympie Rd	CHERMSIDE	59 6255
SA	60 Wright Street	ADELAIDE	212 1962
VIC	399 Lonsdale St	MELBOURNE	67 9834
	656 Bridge Road	RICHMOND	428 1614
	Dandenong Rd	SPRINGVALE	Open soon
WA	414 William St	PERTH	328 6944

DICK SMITH MAIL ORDER CENTRE: PO Box 321, North Ryde NSW 2113. Phone (02) 888 3200

SHOPS OPEN 9AM to 5.30PM
(Saturday: 9am till 12 noon)
BRISBANE: Half hour earlier.
ANY TERMS OFFERED ARE TO APPROVED APPLICANTS ONLY

Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

ISSN 0002 - 6859.

amateur radio

JANUARY 1981
VOL. 49, No. 1

PRICE: $1.30

Registered Office:
3/105 Hawthorn Road,
Caulfield North 3161.

EDITOR:
BRUCE BATHOLS* VK3UV

PRODUCTION MANAGER:
BILL BALY

TECHNICAL EDITORS:
BILL RICE* VK3ABP
EVAN JARMAN* VK3ANI
RON COOK* VK3AFW
GIL SONES* VK3AUI

CONTRIBUTING EDITORS:
BOB ARNOLD VK3ZBB
G. NICK NICHOLS VK6XI
ROY HARTKOPF* VK3AOH
RON FISHER* VK3OM
ERIC JAMIESON VK5LP
LEN POYNTER* VK3BYE
BILL VERRALL VK5WV
WALLY WATKINS VK2DEW

DRAFTING:
NEIL OSBORNE VK3YEI
PETER KIMBER
SUZY ZLOCH

BUSINESS MANAGER:
PETER DODD VK3CIF

***Member of Publications Committee**

Enquiries and material to:
The Editor,
PO Box 150, Toorak, Vic. 3142

Copy is required by the **first of each month.** Acknowledgement may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason. Material should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **25th of the second month preceding publication. Phone: (03) 528 5962.** Hamads should be sent direct to the same address by the **1st of the month preceding publication.**

Trade Practices Act: It is impossible for us to ensure that advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly. Readers are reminded that, when buying, obtaining or receiving goods from overseas including goods listed in advertisements by overseas organisations in this Journal, Customs import duties and Sales Tax may be levied on the goods at the time of importation. These amounts, if any, are payable by the purchaser unless the terms of sale state otherwise and the seller has made specific provision to this effect in his quotation to the buyer or unless other prior arrangements are in force between the buyer and the seller.

Typesetting: MUELLER GRAPHICS PTY. LTD.
1a Levanswell Road, Moorabbin, 3189
Tel.: 553 0292

Printers: WAVERLEY OFFSET PUBLISHING GROUP
Geddes Street, Mulgrave 3170

CONTENTS

TECHNICAL

A New Frequency Counter 8
A Solid State Keyboard for RTTY 15
Home Building 17

GENERAL

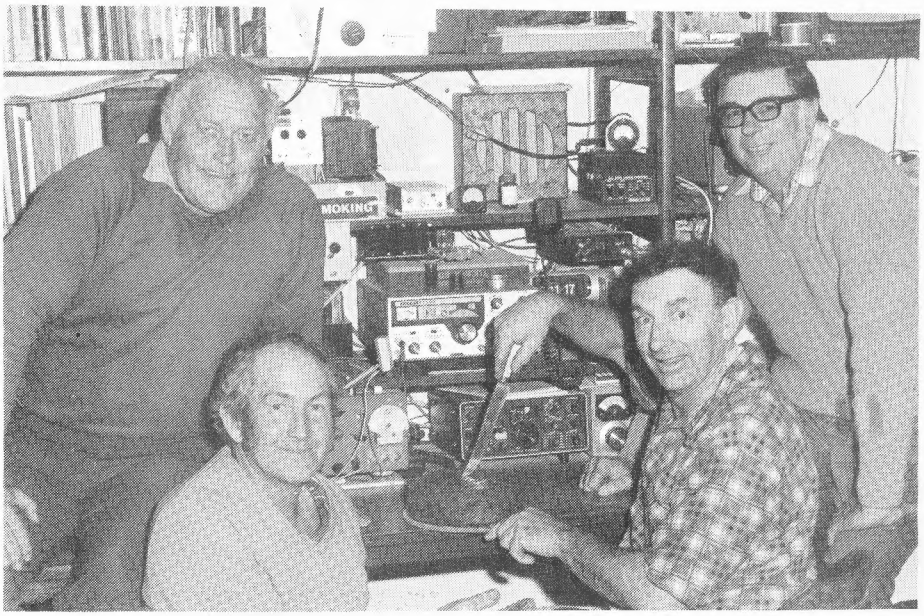
Ballarat Certificate 34
Cockies' Net Second Birthday 26
Index to Vol. 48, January-December 1980 40
John Moyle Memorial Field Day Contest — Rules 1981 19
VK4DO — 57 Years a Radio Amateur 20
World-Wide Communications from Hand-Held and Man-Pack Transceivers, Part 2 22

DEPARTMENTS

ALARA 41
Amateur Satellites 31
Around The Trade 41
Awards Column 39
Commercial Kinks 30
Forward Bias 28
Hamads 42
Ionospheric Predictions 38
Letters to the Editor 39
Main QSP 5
Obituary 42
QRK5 29
QSP 5, 18, 29, 37, 41
Silent Keys 42
Spotlight on SWLing 34
VHF-UHF — an expanding world 24
VK2 Mini Bulletin 28
WIANEWS 6
WICEN 36
You and DX 36

ADVERTISERS' INDEX 42

Cover Photo



Cockies' Net, Second Birthday — See page 26.
Basil VK6BS does the honours, watched by (l. to r.) Brian VK6NOM, Malcolm VK6XM and Don VK6UW.

Simultaneous readout put you ahead with a DAIWA SWR/power meter!

Daiwa's cross needle system provides direct readings of SWR, Forward power and Reflected power. The CN620A covers 1.8-150MHz. Its power mode offers 3 ranges for more accurate and precise measurement.

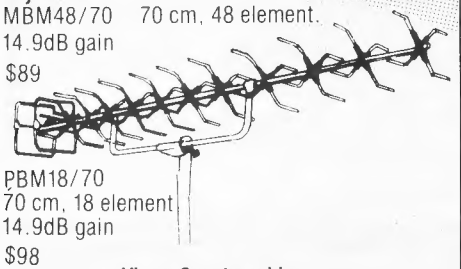
$89

Antennas

Discone
GDX 1
65MHz–520MHz $89
SCANX
65MHz–520MHz $39

Ringo
VAR/2
6dB gain.
Omni-directional with 3 half waves in phase and 1/8 wave stub. Gives extremely low angle of radiation for better signal coverage. $58

Jaybeam
MBM48/70 70 cm, 48 element.
14.9dB gain
$89



PBM18/70
70 cm, 18 element
14.9dB gain
$98

Vicom 2 metre whips

VAW/2/4F	¼ wave fibreglass	$5
VAW/2/4S	¼ wave stainless steel	$5
VAW/2/5	5/8 wave fibreglass	$12
VAW/2B	Base for whips	$4

Vicom 2 metre Beams

VAB/2/10	10 element 12dB gain	$79
VAB/2/5	10 element 8dB gain 500W	$37
VAB/2/X	Crossed Yagi 10 element 12dB gain	$99

Vicom HF whips

VAH/10	Mobile whip 10 m	$30
VAH/15	Mobile whip 15 m	$30
VAH/20	Mobile whip 20 m	$31
VAH/40	Mobile whip 40 m	$30
VAH/80	Mobile whip 80 m	$31

ICOM'S advanced design provides better performance with Mobile Transceivers

IC260A 2m., FM/SSB Mobile is designed to cover mobile, DX, local calls and satellite working. Features dual VFO's, continuous tuning (LED Readout), MOS FETS in RF and 1st mixer stages. Plus Noise blanker, CW Break-in, CW monitor, APC and much more. 10w output.

Check the range of Icom Transceivers

IC2A	2 m FM synthesized handheld	$312
IC22S	2 m FM synthesized transceiver 10W	$299
IC255A	2 m FM synthesized mobile 25W	$436
IC251A	2 m all mode transceiver 10W	$877
IC260A	2 m FM/SSB/CW synthesized mobile 10W	$665
IC280A	2 m FM synthesized remotable 10W	$450
IC502A	6 m SSB portable	$289
IC551	6 m All mode (not FM/VOX/PBT)	$599
IC720	HF all band solid state 100W	$1379
ICPS20	240V AC power supply	$239

Katsumi Morse Keyers

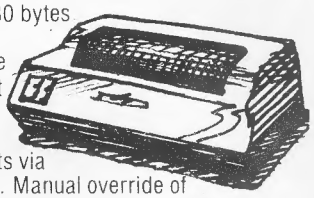
MK 1024 Programmable, electronic keyer $219
EK 121 Keyer with dot memory $69
EK 150
Electronic keyer $131

Bits and Pieces

BL50A
50ohm 4KW Balun $25
BL70A
70ohm 4KW Balun $25
PD30LS
DAIWA low pass filter 32MHz $23
AD103X DAIWA masthead divider 70 m/2 m/HF $67
RD300 Kenwood 300W dummy load $82
VM1 Noise cancelling mic. $15

Tono dot matrix printer gives you radio teletype capabilities

Bi-directional impact printer which prints at 125 ch. per sec. Offer adjustable form width (uses sprocket fanfold paper from 115-240 mm). Full upper/lowercase with programmable character width. Internal buffer holds 80 bytes Software programmable vertical format unit permits full control of vertical formats via control codes. Manual override of main control functions. Takes readily available paper and ribbons.



Model HC800 $999

Tono Theta 7000E
Communications computer $1099

VICOM

Vicom International Pty. Ltd.
68 Eastern Road,
South Melbourne, Vic. 3205
Phone (03)6996700

339 Pacific Highway,
Crows Nest, NSW. 2065
Phone (02)4362766

Brisbane 352522; 3415377
Townsville 772633

Wollongong 291455
Cairns 541035

N.Z. 287946
Adelaide 437981

Wagga 212125
Melbourne 836 8635

QSP QSP QSP

THE DAY THAT "ZERO" CAME TO TOWN

Sydney had lived in television isolation from the channels which worried Amateurs in other cities. Channel 0 had passed us by, 5A was not really a problem as it was at nearby Wollongong, and later Newcastle. When the now retired Minister for Postal and and Telecommunications, the Hon. Tony Staley, announced at the 1979 Federal Convention that the Government decided to use UHF exclusively for the proposed new Special Broadcasting Service for Ethnic television, we considered we had won. We settled back, further reassured that Ch. 0 was on the way out when it was also announced that the Melbourne commercial Ch. 0 was also changing to another channel.

1980 however, dawned badly. Within days of Ch. 0 Melbourne moving to 10, an announcement that "short" term use would be made of VHF in Sydney and Melbourne to simulcast the SBS programme with UHF until viewers obtained UHF facilities. The SBS (its title was then being changed to the Independent and Multicultural Broadcasting Corporation — IMBC) picked October the 24th, United Nations Day, for the grand opening. Amateurs still felt safe, they either casually commented that "I don't use 6, so it doesn't worry me", or "there is the UHF service — viewers will use that".

Six metres is one of the last regions of that part of the spectrum where an Amateur can easily research characteristics. It is not new ground, 50 years ago the late Ross Hull — in whose memory the annual national VHF contest is conducted — did much of the pioneering work on the then segment of five metres. Amateurs knew the characteristics of these bands (6 and 5 metres) and were surprised when in the early 1960s the even lower frequencies of 45-52 MHz were selected for the television service, and even more surprised when the locations for the transmitters were announced.

Last October when the "low powered" IMBC Ch. 0 transmissions commenced there was outcry on the poor coverage; but not a word about the excellent UHF signal on Ch. 28. The media seldom mentioned 28, nor did the programme guides, nor did the station. Then, on opening night, the 6 metre amateur band opened just after the start of the programme. Even weeks later, there was little mention of the UHF signal or how to receive it. Strange indeed when Recommendation Two from the third report of the Ethnic Television Review Panel — 6 February 1980 — states (in part) "Multicultural television must be accessible to the community at large". To me, this means education of the public that Ch. 0 is only an interim service. It has technical limitations and that they are not receiving the best service. Amateurs should draw attention to excellent UHF service, but should not belittle the programme or its concept; that is not our concern.

The WIA has already done considerable work in trying to have non-standard television channels removed (report to the Minister, March 1979, on Ch. 5A, constant requests for return of a portion of the 50 MHz band for Amateur use). This is a good start but it still needs the weight of the Amateur Service to achieve the goal.

To amateurs who live in other major centres — do not think Ch. 0 might not come to you. The last paragraph in the report estimates some of the costs of extending IMBC to other cities. There are seven major centres listed, namely: Canberra, Wollongong, Newcastle, Adelaide, Brisbane, Perth and Darwin. Television likes to "network" and "0" is a convenient symbol.

Do your bit — now — lobby to remove Ch. 0 transmissions, and encourage viewers to use Ch. 28 — the promised and superior service.

TIM MILLS VK2ZTM,
Federal Councillor VK2 Division. ■

FM FOR CB

According to Radio ZS of August 1980 the Netherlands recently legalised CB radio for type-approved FM gear limited to 0.5W output on 22 channels on the 27 MHz band. One reason for FM 0.5W was that the postal authorities, after conducting extensive tests for BCI and TVI, found that interference could be considerably reduced or completely avoided. Only vertically polarized omni-directional antennas may be used. ■

160m BAND

Danish amateurs (about 50 designated licensees) have been given permission for one year to operate CW with 10W DC input in segments 1720-1740 kHz and 1830-1850 kHz subject to non-interference clauses.—IARU RI News October 1980. ■

LIMITED SUFFIXES

According to the latest call sign listings for Victoria a new suffix "X" supplements the Zs and Ys. ■

US PHONE SEGMENTS

According to IARU RI News October 1980 the Board of ARRL directed the filing of a petition to FCC requesting that the 14 MHz phone sub-band be increased by 50 kHz, with an Extra Class sub-band for 14.15 to 14.175 MHz and an Advanced/Extra sub-band from 14.175 to 14.225 MHz. Also that Extra Class Voice operation be permitted between 7075 and 7100 kHz without eliminating CW or RTTY use by other licensees. ■

WIANEWS

1981 FEDERAL CONVENTION

The first Agenda Item for the 1981 Federal Convention has been received from the VK6 Division and seeks to cancel a motion from the 1975 Federal Convention which, in essence, granted authority to the Federal Contest Manager to make or amend any of the R.D. Contest Rules. Various reasons were given for seeking a return to previous traditional methods relating to the rules of this Contest.

WAVCKA AWARD

At the Executive Meeting on 20th November it was agreed that the WAVCKA Award should be opened up for Australian amateurs with effect from 1st January 1981 (for contacts on or after 1.1.1981). The rules of the Award will be suitably amended and will include a total of 77 contacts to quality (10 on at last 3 bands for each of VK2 to 7, 5 on 2 bands for each of VK1 and VK8, 4 in 3 call areas of VK9 and 3 in 2 call areas for VK0); a separate award will not be available for any particular mode; proofs by production of QSL. The original suggestion from VK6.

GENERAL

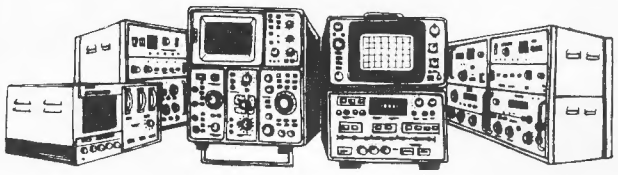
New Chairmen are to be sought to replace Keith Malcolm VK3ZYK of the VHFAC and Bob Arnold VK3ZBB of Project ASERT, both of whom have resigned owing to pressures of work.

INTERFERENCE

AMATEURS SHOULD AVOID CAUSING INTERFERENCE TO OTHER SERVICES — WILFUL INTERFERENCE SHOULD BE AVOIDED LIKE THE PLAGUE. WHILE MANY AMATEURS ARE CONSCIOUSLY TRYING TO ENHANCE THE PUBLIC'S IMAGE OF OUR HOBBY, IT HAS BEEN REPORTED THAT SOME ARE DOING THEIR BEST TO UNDO ANY GOOD THAT HAS BEEN DONE IN THE PAST.

ALL AMATEURS SHOULD READ CAREFULLY SECTIONS 5.37, 5.38 AND 5.39 OF THE HANDBOOK AND UNDERSTAND THE IMPLICATIONS — COPIES OF THE HANDBOOK ARE AVAILABLE FROM YOUR DIVISION.

P. WOLFENDEN VK3ZPA, Federal President ■



SERVICE PROBLEMS?

Suffer no more — contact the experts:

GFS ELECTRONIC IMPORTS

15 McKeon Road,
Mitcham, Vic. 3132
Phone (03) 873 3939

Because we have many years experience in the Communications Service Industry, encompassing the CB, AMATEUR and COMMERCIAL sectors we are able to offer you the best service that your set deserves at a realistic price.

Call and discuss your problems with our experts.

WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Mr. P. A. Wolfenden VK3ZPA

Federal Council:
VK1 Mr. R. G. Henderson VK1RH
VK2 Mr. T. I. Mills VK2ZTM
VK3 Mr. G. A. G. Williams VK3ZXW
VK4 Mr. A. R. F. McDonald VK4TE
VK5 Mr. G. Preston VK5PI.
VK6 Mr. N. R. Penfold VK6NE
VK7 Mr. B. J. Morgan VK7RR

Staff: Mr. P. B. Dodd VK3CIF, Secretary.
Part-time: Col. C. W. Perry, Mrs. J. M. Seddon and Mr. Bill Baly (AR Production).

Executive Office: 3/105 Hawthorn Rd., Caulfield North, Vic. 3161. Ph. (03) 528 5962.

Divisional Information (all broadcasts are on Sundays unless otherwise stated).

ACT:
President — Mr. A. Davis VK1DA
Secretary — Mr. F. Robertson-Mudie VK1MM.
Broadcasts— 3570 kHz and 2m Ch. 6 (or 7): 10.00Z.

NSW:
President — Mr. A. D. Tilley VK2BAD
Secretary — Ms. S. J. Brown VK2BSB
Broadcasts— **1100 local.** 1.825, 1.8125 (Ncle), 3.595, 7.146, 28.32, 52.1, 52.525, 144.15 MHz, Rptr. Ch. 6650 Oberon, 6750 Gosford, 6800 Lismore, 6850 Wollongong, 7000 Sydney, 8525 Sydney.
1930 local. 52.1, 52.525, 144.15 MHz, Rptr. Ch. 6650 Oberon, 6750 Gosford, 6850 Wollongong, 7000 Sydney, 8525 Sydney, Relays on 160, 80 and 10 metres.
RTTY **0030Z.** 7.045, 14.090, 146.6 MHz. **0130Z.** 21.095 MHz. **0930Z.** 3.545, 146.6 MHz.
Mondays **1930 local.** Newcastle. 3.595 MHz, 10m, Rptr. Ch. 6750 Gosford, 6900 Newcastle.

VIC.:
President — Mr. A. R. Noble VK3BBM
Secretary — Mr. J. D. M. Dowie VK3BVE
Broadcasts— 1840, 3600, 7135 kHz — 53.032 AM, 144.2 USB and 2m Ch. 2 (5) repeater: 10.30 local time.
Gen. Mtg. — 2nd Wed., 20.00.

QLD.:
President — Mr. A. J. Aarsse VK4QA
Secretary — Mr. W. L. Gielis VK4ABG
Broadcasts— 1825, 3580, 7146, 14342, 21175, 28400, kHz; 2m (Ch. 42, 48): 09.00 EST.
Gen. Mtg. — 3rd Friday.

SA:
President — Mr. I. J. Hunt VK5QX
Secretary — Mr. W. M. Wardrop VK5AWM
Broadcasts— 1820, 3550, 7095, 14175 kHz; 21.160 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.
Gen. Mtg. — 4th Tuesday, 19.30.

WA:
President — Mr. B. Hedland Thomas VK6OO
Secretary — Mr. Peter Savage VK6NCP.
Broadcasts— 3560, 7075, 14100, 14175 kHz. 28.47, 53.1 MHz. 2 metres Ch. 2 Perth, Ch. 6 Wagin. Time 0130Z.
Gen. Mtg. — 3rd Tuesday.

TAS.:
President — Mr. R. Emmett VK7KK
Secretary — Mr. B. J. Morgan VK7RR
Broadcasts— 7130 (SSB) kHz with relays on 6 and 2m Ch. 2 (S), Ch. 8 (N), Ch. 3 (NW), 09.30 EST.

NT:
President — Mr. T. A. Hine VK8NTA
Vice-Pres. — Barry Burns VK8DI
Secretary — Robert Milliken VK8NRM
Broadcasts— Relay of VK5WI on 3.555 MHz and on 146.5 MHz at 2330Z. Slow morse transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal Information:
VK1 — P.O. Box 46, Canberra, 2600.
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs 9.45-13.45h).
P.O. Box 123, St. Leonards, NSW 2065.
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 7535 Weekdays 10.00-15.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton.
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX
The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 46, Canberra, A.C.T. 2600.
VK2 — QSL Bureau, C/- Hunter Branch, P.O. Teralba, N.S.W. 2284.
VK3 — Inwards QSL Bureau, Mrs. B. Gray VK3BYK, 1 Amery Street, Ashburton, Vic. 3147.
VK3 — Outwards QSL Bureau, Mr. R. R. Prowse VK3XY, 83 Brewer Road, Bentleigh, Vic. 3204.
VK4 — QSL Officer, G.P.O. Box 638, Brisbane, Qld., 4001
VK5 — QSL Bureau, Mr. Ray Dobson VK5DI, 16 Howden Road, Fulham, S.A. 5024.
VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O. Box F319, Perth, W.A. 6001.
VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.
VK8 — QSL Bureau, C/- VK8HA, P.O. Box 1418, Darwin, N.T. 5794.
VK9, 0 — Federal QSL Bureau, Mr. N. R. Penfold VK6NE, 388 Huntriss Rd., Woodlands, W.A. 6018.

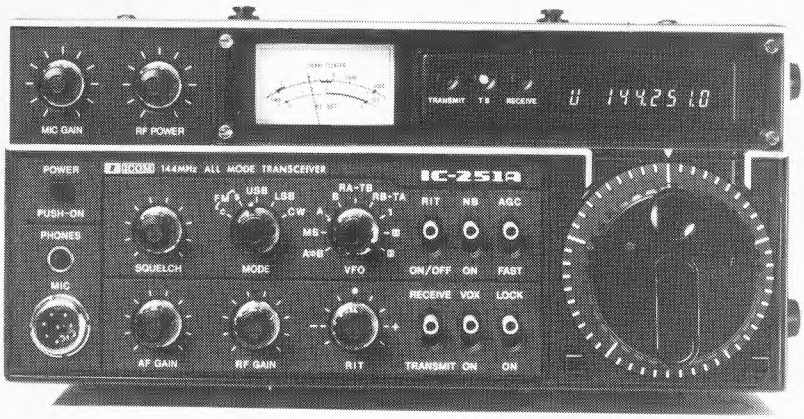
From ICOM, of course. Each of these brilliantly designed transceivers utilizes a special *micro-computer* equipped with ICOM designed programming to offer you features and operational flexibility you won't find elsewhere. *Memory Scan* allows you to monitor three different memory channels. *Program Scan* scans continuously between two programmed frequencies. Scanning speed is adjustable.

VICOM carries ICOM's compact all mode transceivers in configurations to cover 143.8-148.2MHz and 50-54MHz. (The IC551D model will even provide 100 watts on 6 metres!)

All are backed with VICOM's 90 day warranty and technical/spares back-up. But of course, all this is the kind of quality and service you naturally expect when ICOM and VICOM get together.

3 Highly intelligent ways to cover your transceiver needs at Vicom

IC260A 2M. FM/SSB MOBILE: For mobile, DX, local calls and satellite work. Features dual VFO's, continuous tuning (LED readout), MOS FET's in RF and 1st mixer stages–plus Noise Blanker, CW Break-in, CW monitor, APC and much more. 10w output.



IC251A 2M. ALL MODE FIXED OR PORTABLE: FM, USB, LSB and CW coverage makes this unit ideal for use in mobile, DX, local or satellite work. Features include continuous tuning, of course, with 7 LED readout, dual VFO's, built-in 240 AC and DC power. 1.5w audio output makes for easy listening even in noisy surroundings.

IC551 10w 50-54MHz FIXED OR PORTABLE: All of ICOM's best features including all mode capability, SSB, CW, AM and FM. Two VFO's, built-in 240 AC or DC power. Noise blanker. Excellent spurious and intermodulation characteristics. 2 watts audio output.

Vicom International Pty Ltd

68 Eastern Road,
South Melbourne, Vic. 3205.
Phone (03)6996700

339 Pacific Highway,
Crows Nest, NSW. 2065.
Phone (02)4362766

VICOM

Brisbane 352522; 3415377
Townsville 772633

Wollongong 291455
Cairns 541035

Adelaide 437981

Wagga 212125
Melbourne 8368635

A New Frequency Counter

W. Beyer VK3BHW
6 Anna Court, Sale, Vic. 3850.

This multi-function counter was developed by Mr. E. H. T. Van der Heyden and Mr. O. A. Kuhn, whom I met during a radio amateur meeting at Wagening, in Holland, last year. The counter was demonstrated for the first time that night and was very impressive. I hope that it might be interesting for Australian amateurs to see how the PA0s make their test equipment.

The idea for the counter started when Intersil marketed their ICM7226A/B in the USA. It is a multi-function chip which can perform all of the following functions: frequency counting, period measurement, frequency ratio, time and unit counting. The upper frequency limit of the chip itself is 10 MHz.

The complete counter is comprised of four boards, each forming a logical unit.

(a) The counter proper.
(b) Readout and control panel.
(c) Pre-amplifiers.
(d) The power supply.

A block schematic of the ICM7226, the heart of this counter, gives a breakdown of its basic functions (Fig. 1). This chip is a counter by itself with the remaining circuitry being peripheral, but adding to the unit's sophistication. The versatility of this chip is best demonstrated by example of the counter's functions.

FREQUENCY COUNTER

Frequency measurement, up to 10 MHz, is performed directly by the chip. The input is raised to TTL level by the pre-amplifier (A1) before being fed to the chip. Using the time base switch, count periods of 10 msec. to 10 sec. can be selected, giving resolutions of 100 Hz to 0.1 Hz. The position of the decimal place is made automatically ensuring that the readout is always in kilohertz. Leading zeros are automatically suppressed. Over-range, when the most significant digit is lost, is indicated by an over-range LED.

Time between counts is 200 msec. and is independent of the selected count period. The reset enables the user to re-start a count cycle at any time, a useful feature with the 10 sec. count period.

When measuring frequencies higher than 10 MHz, the pre-scalers are used. Up to 50 MHz a TTL 74196 is switched in. It drives an extra 7 segment decoder driver ensuring that short measuring times are maintained. Placing of the decimal point is still automatic. Counting up to 500 MHz is done with a pre-scaler (SP8515) chip. To compensate for the pre-scaler, the clock signal is also divided by 10 with an extra decade counter, maintaining correct decimal point positioning. While using the pre-scaler the smallest count period (0.01 sec.) cannot be used.

PERIOD COUNTER

Period measurements are made directly with the chip: no pre-scaler is used. The smallest measurable period is 0.5 usec. Display is made in microseconds with automatic positioning of the decimal point. The time base switch is used to select the number of periods to be measured and an average is displayed. Selection is made from 1, 10, 100 and 1000 periods.

TIME INTERVAL MEASUREMENT

When measuring time intervals ,both A and B inputs are used. A negative going edge at A starts the cycle and a negative going flank (trailing edge) at B stops the counter. The time interval is then displayed. It is also possible to use a positive going edge to terminate the count and a positive going flank to begin. These are selected using a pair of "exclusive OR" gates and set by front panel switches. To measure a single event (e.g. pulse length) the signal is connected to both inputs.

FREQUENCY RATIO

Frequency ratio measurements are restricted to 10 MHz as no pre-scalers are used. The ratio of input frequencies A and B is measured and the sample can be averaged over 1 to 1000 periods of the B input frequency.

CIRCUIT DESCRIPTION

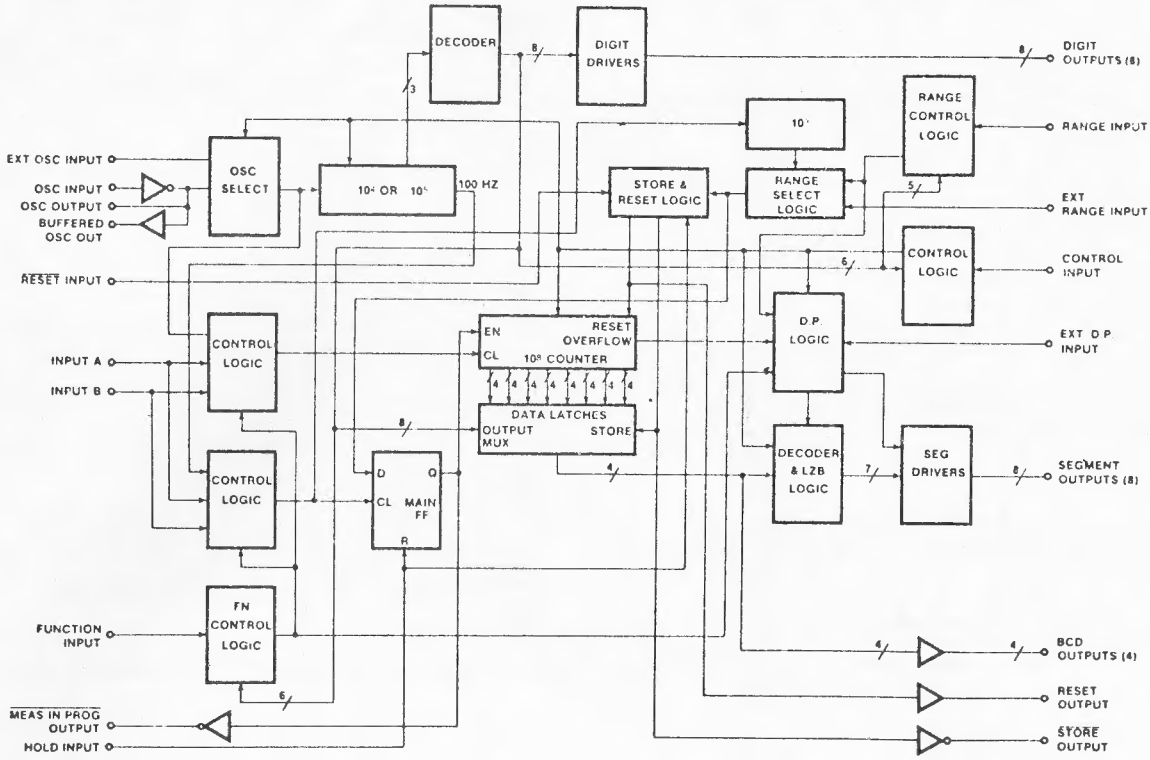
The best place to start in a counter such as this one is with the central chip: the ICM7226A.

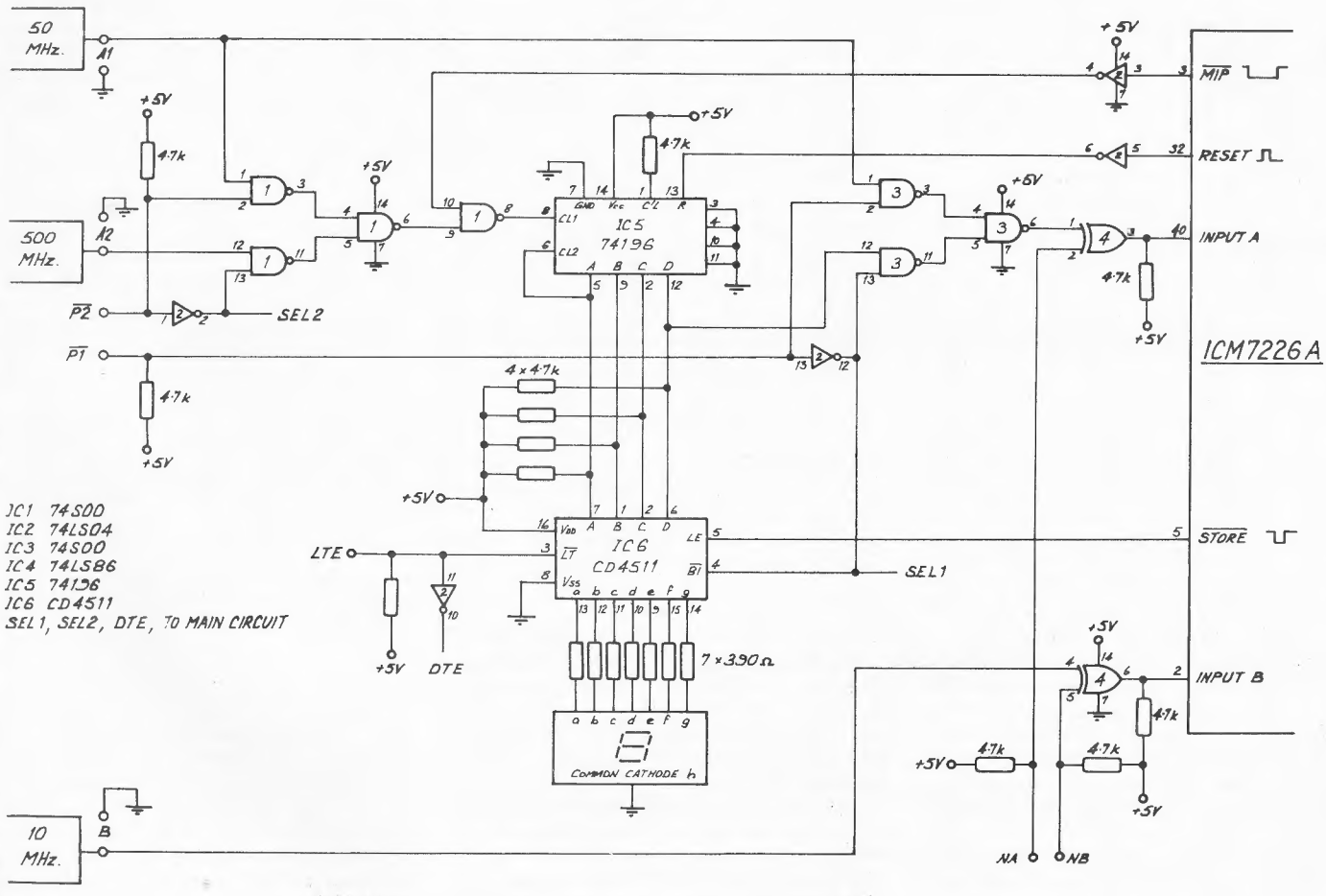
The clock, or time base, oscillator consists of a pair of complementary FET inverters within the chip. The frequency determining components are connected to pins 35 and 36. The 22 Mohm resistor sets the bias for the oscillator. The chip is designed for a 10 MHz crystal which should be made for a series resistance and parallel capacity of 22 pF. The 50 pF trimmer is used to fine tune the crystal.

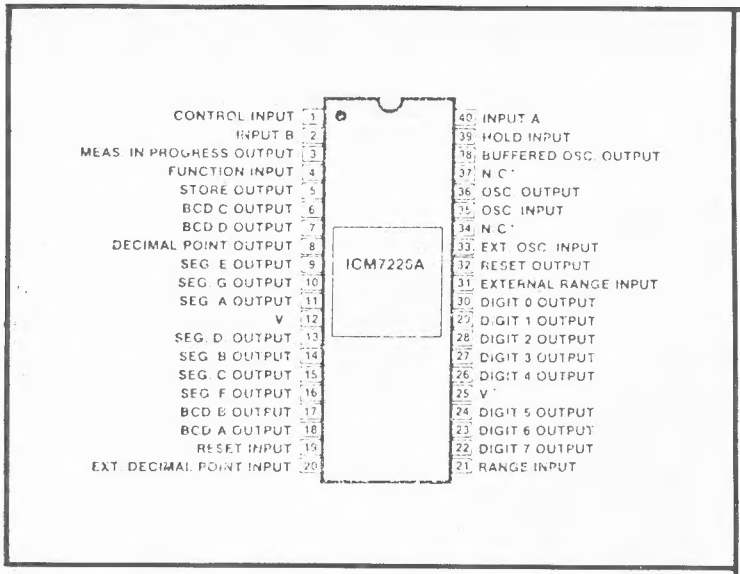
There is also provision for an external time base. In fact the time base can be taken from any of four sources. This is done using a CMOS dual 4052 analogue multiplexer/demultiplexer chip. Table 1 gives the possible combinations.

The external oscillator switching is controlled by both the pre-scaler and external oscillator control lines (pins 9 and 10 of IC8). There is a 1 pole 4 throw switch controlled by these two inputs; there being combinations on four lines. There are two switches in the chip, the second being used in the control circuitry. The use of this chip and IC9, a quad 1 pole 1 throw, in order to obtain automatic switching of

FIGURE 1 (opposite top) shows a block diagram of the heart of the counter, the ICM7226A/B where FIGURE 2 (bottom) shows the input circuit for the counter.


DECODER
DIGIT DRIVERS
DIGIT OUTPUTS (8)
RANGE CONTROL LOGIC
RANGE INPUT
EXT OSC INPUT
OSC INPUT
OSC OUTPUT
BUFFERED OSC OUT
OSC SELECT
100 HZ
STORE & RESET LOGIC
RANGE SELECT LOGIC
EXT RANGE INPUT
CONTROL LOGIC
CONTROL INPUT
RESET INPUT
INPUT A
INPUT B
CONTROL LOGIC
EN
RESET OVERFLOW
CL
DATA LATCHES
OUTPUT MUX
STORE
D.P. LOGIC
EXT D.P. INPUT
DECODER & LZB LOGIC
SEG DRIVERS
SEGMENT OUTPUTS (8)
D
Q
CL
MAIN FF
R
FUNCTION INPUT
FN CONTROL LOGIC
BCD OUTPUTS (4)
RESET OUTPUT
STORE OUTPUT
MEAS IN PROG OUTPUT
HOLD INPUT


50 MHz.
500 MHz.
10 MHz.
+5V
4·7k
SEL2
SEL1
IC5 74196
IC6 CD4511
4 x 4·7k
7 x 390Ω
LTE
DTE
COMMON CATHODE
MIP
RESET
INPUT A
INPUT B
STORE
NA
NB
ICM7226A
IC1 74S00
IC2 74LS04
IC3 74S00
IC4 74LS86
IC5 74196
IC6 CD4511
SEL1, SEL2, DTE, TO MAIN CIRCUIT



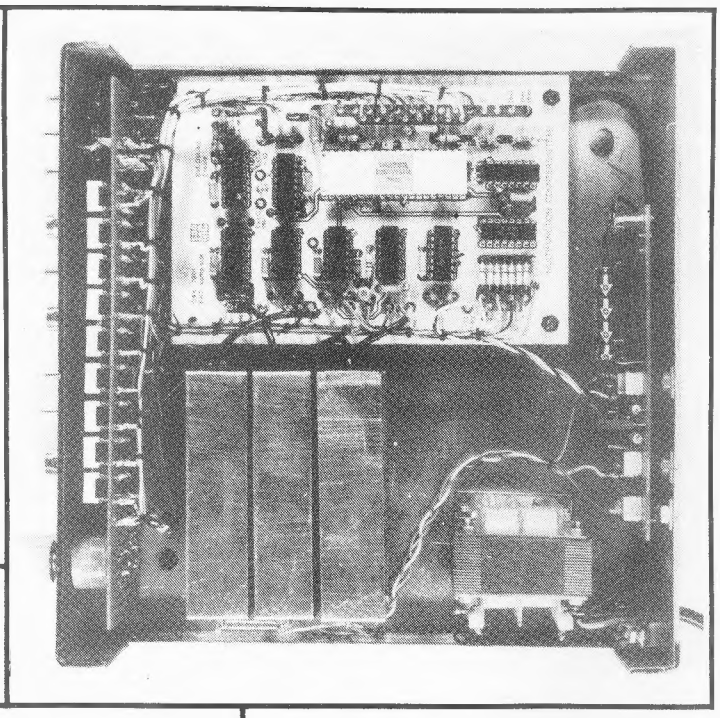
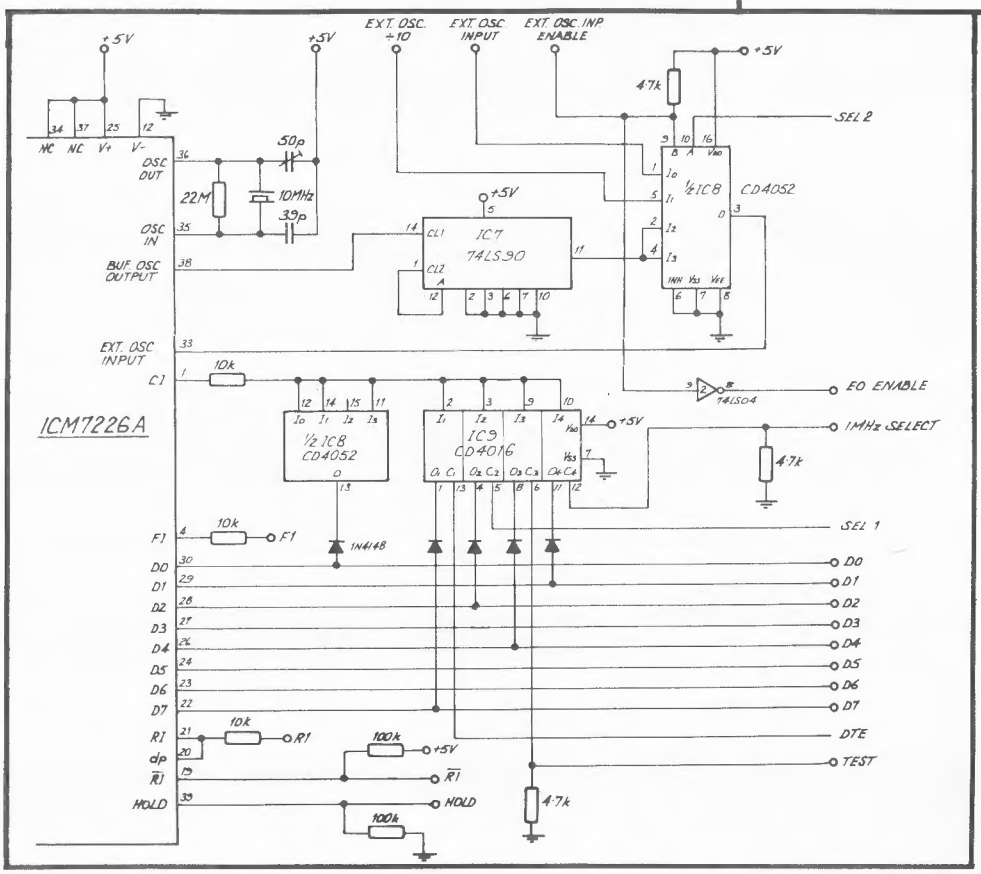


FIGURE 2A (above): The ICM7226A pin configuration. For maximum frequency stability connect to V+ or V—. At right, PHOTO 2 shows the neat lay-out of the counter, while FIGURE 3 (below) depicts the control logic configuration.



"EXT OSC INP enable" going LOW turns ON EXT OSC.

External Oscillator	Prescalar	
OFF	OFF	Internal time base in use: normal operation. Note that the external time base still receives a signal input, but this is not in use.
OFF	ON	Time base is derived by passing the internal oscillator through the decade counter (IC7) to compensate for the SP8515 pre-scaler.
ON	OFF	External oscillator is used for the time base. Note that the EO ENABLE will be high (ON) and could be used to drive external switching for the oscillator.
ON	ON	The time base is now derived from "EXT OSC ÷ 10" input. Decimal point placement requires the lower frequency with the pre-scaler.

TABLE 1: How the timebase signal is obtained.

multiplexed outputs has considerably extended the factilities and power of this counter. It is a circuit technique that should find more scope as this sort of LSI becomes more available to the home-builder.

When using either pre-scaler, the control line SEL1 goes high. Apart from re-directing the signal through the 74196, it is used to control a bilateral switch (¼ of the '4016) which is used to connect the output D2 to the control input (CI). This moves the decimal place. When the 500 MHz pre-scaler is used the control line SEL2 goes high, which ensures that the time base frequency is also divided by ten, preserving the correct decimal placing.

External standards should be at 10 MHz, but by connecting the EO ENABLE to the 1 MHz SELECT line, a 1 MHz standard can be used.

In order to be able to have as many functions as the 7226 has, the control circuits have had to be multiplexed using the digit drive lines (D0 to D7). Referring to the switch wiring schematic gives a good idea of how the function (FI) and range (RI) inputs are multiplexed, but the control input (CI) needs a little more explanation. By using a quad bilateral switching chip ('4016) four of this input's functions can be remotely controlled. The decimal point

placing has already been dealt with. By grounding the DTE line the LED display can be lit (all 8s) to check the display. Grounding the TEST line allows the internal oscillator to be counted. The display will show 10 MHz no matter what the actual frequency is. If it doesn't then something is wrong. The 1 MHz SELECT line allows you to use a 1 MHz time base without converting the counter's reading.

The 50 MHz pre-scaler is also housed on the main PCB. This is a TTL 74196 decade counter with the BCD output connected to a 4511 lamp driver/decoder. When the pre-scaler is not in use the SEL1 line blanks the display (IC6 pin 4). The 4511 drives a common cathode display but the 7226 drives common anode displays.

The remaining logic gates just regulate the signal directions.

Note that the B input is connected straight into the chip and the maximum frequency on this line is 2.5 MHz. The only signal processing on this line is done by the pre-amplifier.

INPUT AMPLIFIERS

A most important part of any counter is the input pre-amplifiers for they determine the counter's sensitivity. An input should have an impedance of 1 Mohm with a parallel capacitance of about 50 pF. The impedance is strongly influenced by this input capacitance and above 50 MHz it will be difficult to maintain this specification. This design does not entail any special circuitry in the 500 MHz pre-amplifier as 75 ohms seems adequate.

The 50 MHz amplifiers are designed to amplify and square the sine wave input. A triple differential amplifier 9582 (Fairchild) achieves this. The BF245AA buffers the input and the first stage is the actual pre-amplifier. The second amplifier is wired as a Schmidt trigger to square the waveform. The third stage does most of the amplification and this is buffered by the two trailing transistors. The final transistor brings the signal to TTL standards.

The input sensitivity of the pre-amplifier is about 35 mV and the two diodes form a clamp to prevent over-driving. These amplifiers are very sensitive: 5 mV at HF, 35 mV at 145 MHz and 100 MHz at their upper frequency limit (about 350 MHz). They are very hot when running, due to class A operation of their transistors, dissipating 500 mW in heat.

The B input uses the same amplifier design, thus requiring two pre-amplifiers in the completed counter.

500 MHz PRESCALER

The pre-scaler uses a SP8515 (Plessey) chip which is sufficiently sensitive to warrant deleting the input amplifier. The input is again protected by diode clamps, however the schottky diode would be a better choice, e.g. HP5082-2800 series. The pre-scaler is ECL and so requires a level converter, filled by the transistor stage. A tendency to oscillate has been found with some of these chips. This still happens with the input disconnected and is caused by exceptionally high gains in a *few* chips. The manufacturers specify a peak in the gain at about 250 MHz. If the counter reads with no input this is the cause. It can be remedied by placing a resistor between the input pin and (10) the value of which must be determined by experiment. Start with a value of 100 kohms and swap for the next lower value until the counter gives a steady zero reading. Even with the lowest of values (15 kohms) the sensitivity will be hardly impaired. Do this, if necessary, after the "setting up" adjustment of resistor "R".

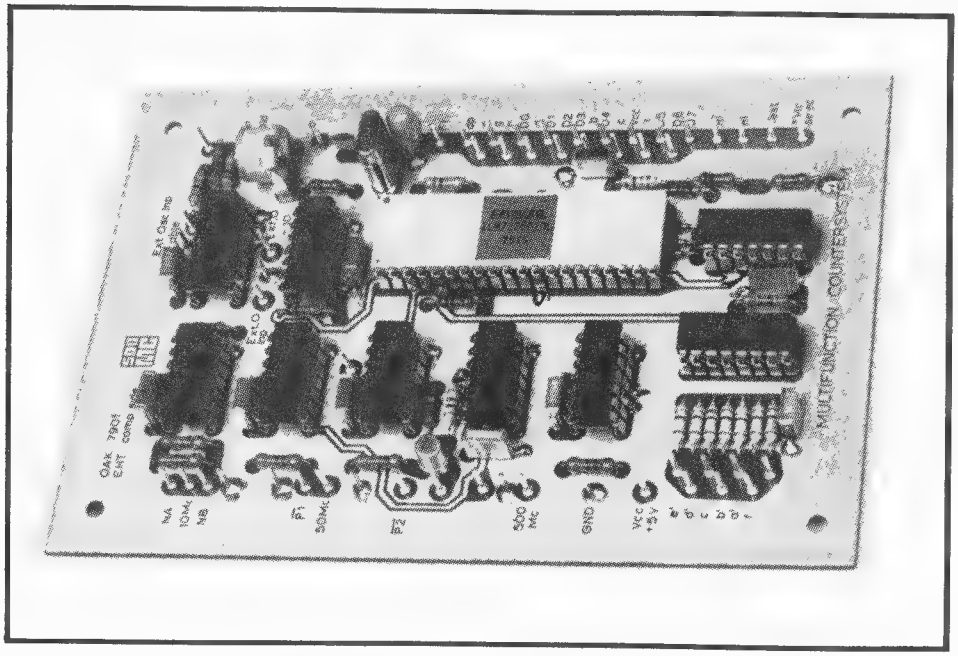
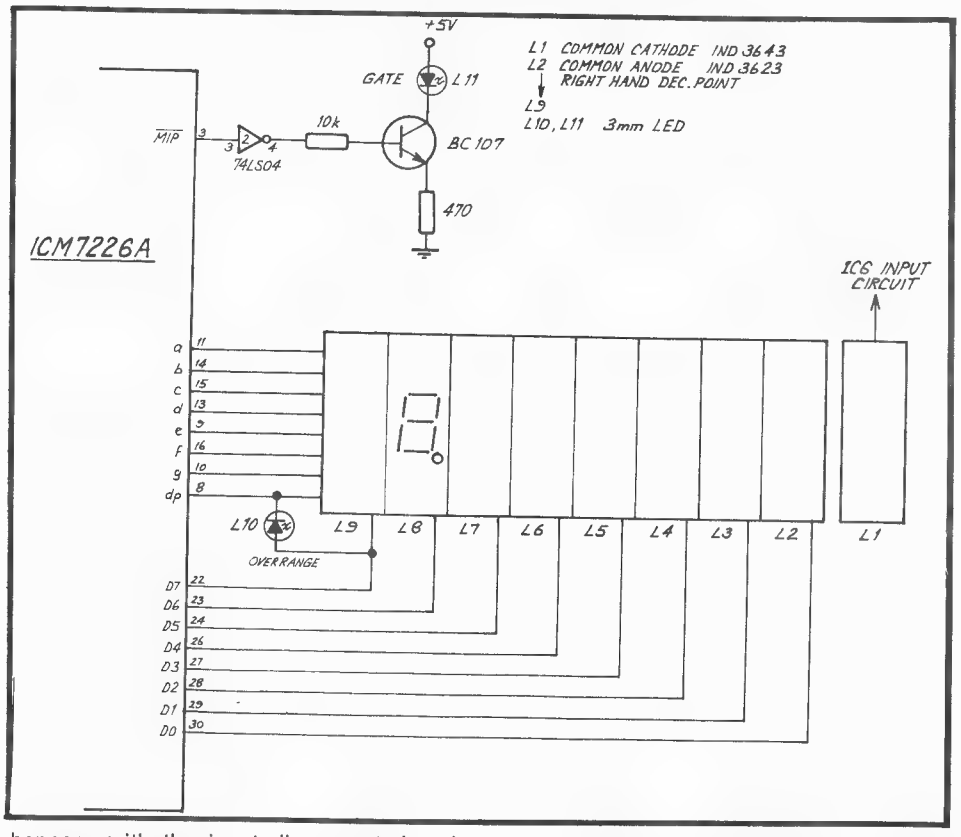


PHOTO 3 (above) shows the lay-out of the counter system, the heart being the ICM7226A. FIGURE 4 (below) shows the display circuit.



POWER SUPPLY

The counter requires two supply voltages: 5 volts for the counter and display boards and 12 volts for the pre-amplifiers. The 5 volt supplies in the pre-amplifiers are obtained with separate 7805 regulator chips.

The counter and display boards draw about 400 mA and a 7805 attached to

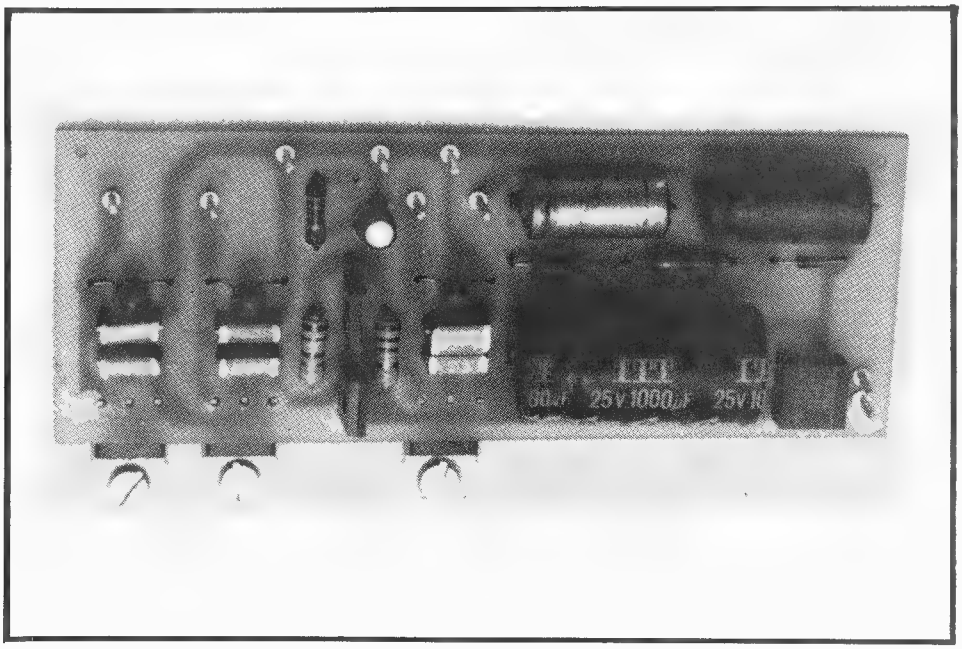
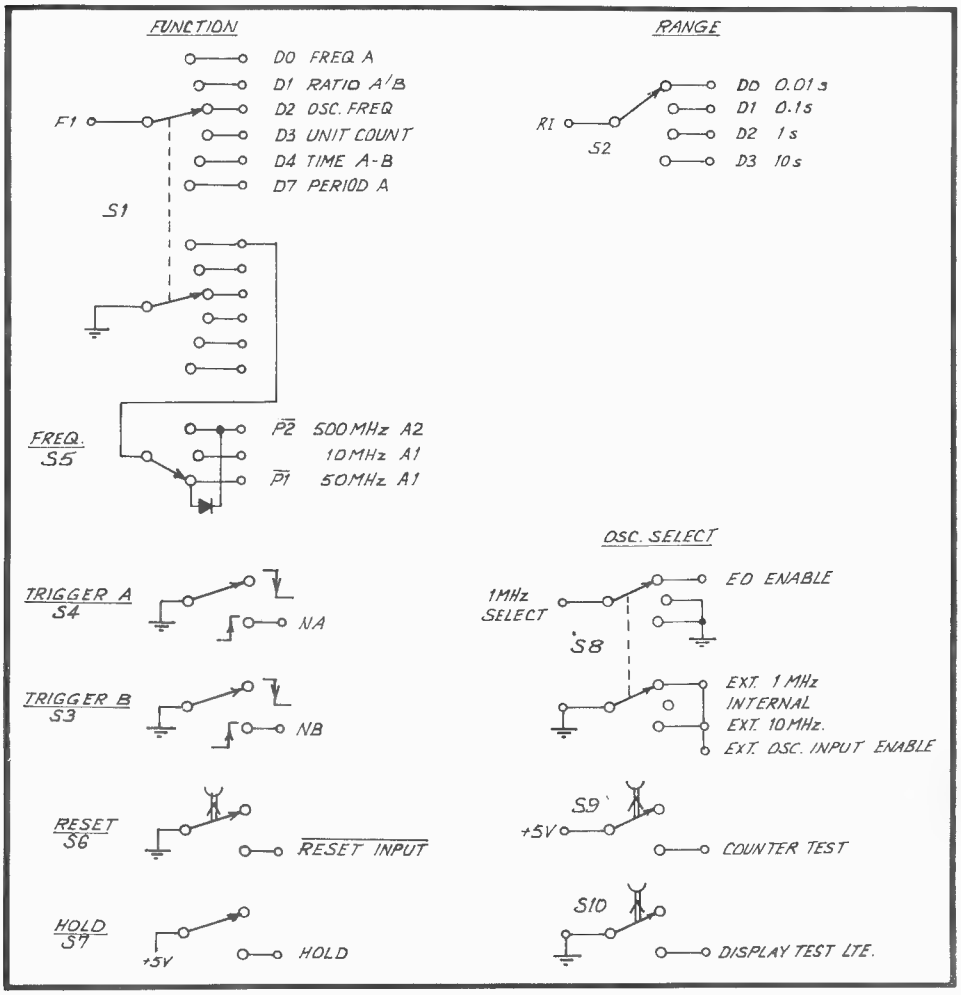


PHOTO 4 (above) shows the power supply board lay-out — while FIGURE 5 (below) illustrates the wiring of switches.



the chassis supplies this requirement easily. The 12 volt supply is controlled by a zener diode regulator.

The pre-scaler board draws around 70 mA and dissipates a fair amount of heat. (It's those class A amplifying transistors in the 8515). Consequently the supply is turned off when the pre-scaler is not in use. The supply to the pre-amplifiers is switched for the same reason (and for the same cause.—Ed.). Transistors T1 and T2 do the switching, guided by the input selector control line P2.

CONSTRUCTION

The usual precautions apply to the building of this counter as would apply to the construction of any digital project. It is best to use the following sequence when soldering the boards:—

1. IC sockets and molex pins.
2. Resistors and capacitors.
3. Diodes and transistors.
4. Integrated circuits.

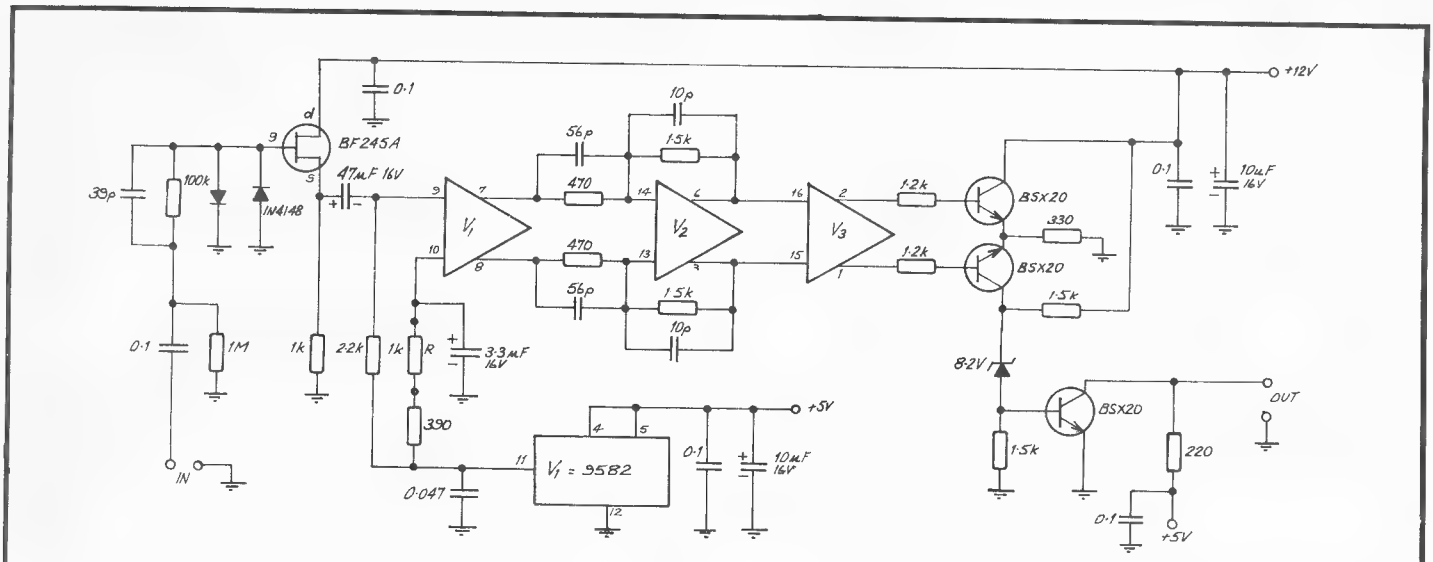
On the counter board the TTL chips can be soldered without pins except where a connection is required on both foils. Here it is better to use molex pins. The ICM7226A requires a socket (or molex pins) if not because of the chip's expense, then because three diodes have to fit under it; see photograph.

On the input amplifier board all the ICs should be soldered otherwise its performance may be impaired at high frequency. The resistors marked "R" should be temporarily replaced with potentiometers for initial adjustment. After that they will be replaced with a fixed value resistor. After everything is mounted a piece of tin metal (about 2 cm high) is bent around the board and then soldered to the component side. This is for screening. The supply voltages are brought to the amplifiers through feed-through capacitors on one of the shorter sides of the PCB. Directly opposite two holes are required in the screen to accommodate the input and output cables; coaxial cables please. Mounting holes are drilled in one of the longer sides.

The LED displays would be better mounted on sockets. That way replacement, if required, will not cause any pain. All the rest of the circuitry is straightforward, but remember that the power supply regulators need to be mounted so that they use the chassis as a heatsink.

One of the photographs shows the component placement on the chassis; its dimensions are 50 mm x 200 mm x 200 mm (h. x w. x d.). The boards are mounted with stand-off bolts; 10 mm long. The three input amplifiers are mounted along one of their long sides: the one with the mounting holes. The display PCB has not been included because it uses switch types that are not available in Australia. Use of different LED displays has been allowed as the specified types are difficult to obtain. The display can be easily mounted on veroboard if you are unable to design a suitable PCB. All switches and BNC connectors are mounted on the chassis.

Once all the boards and components are mounted in the chassis the counter should be wired up except for the input amplifiers and the pre-scalers. The power transfomer wiring and fuse should be kept as far away from the counterwiring as possible. Check the wiring and power supply voltages (they shouldn't deviate



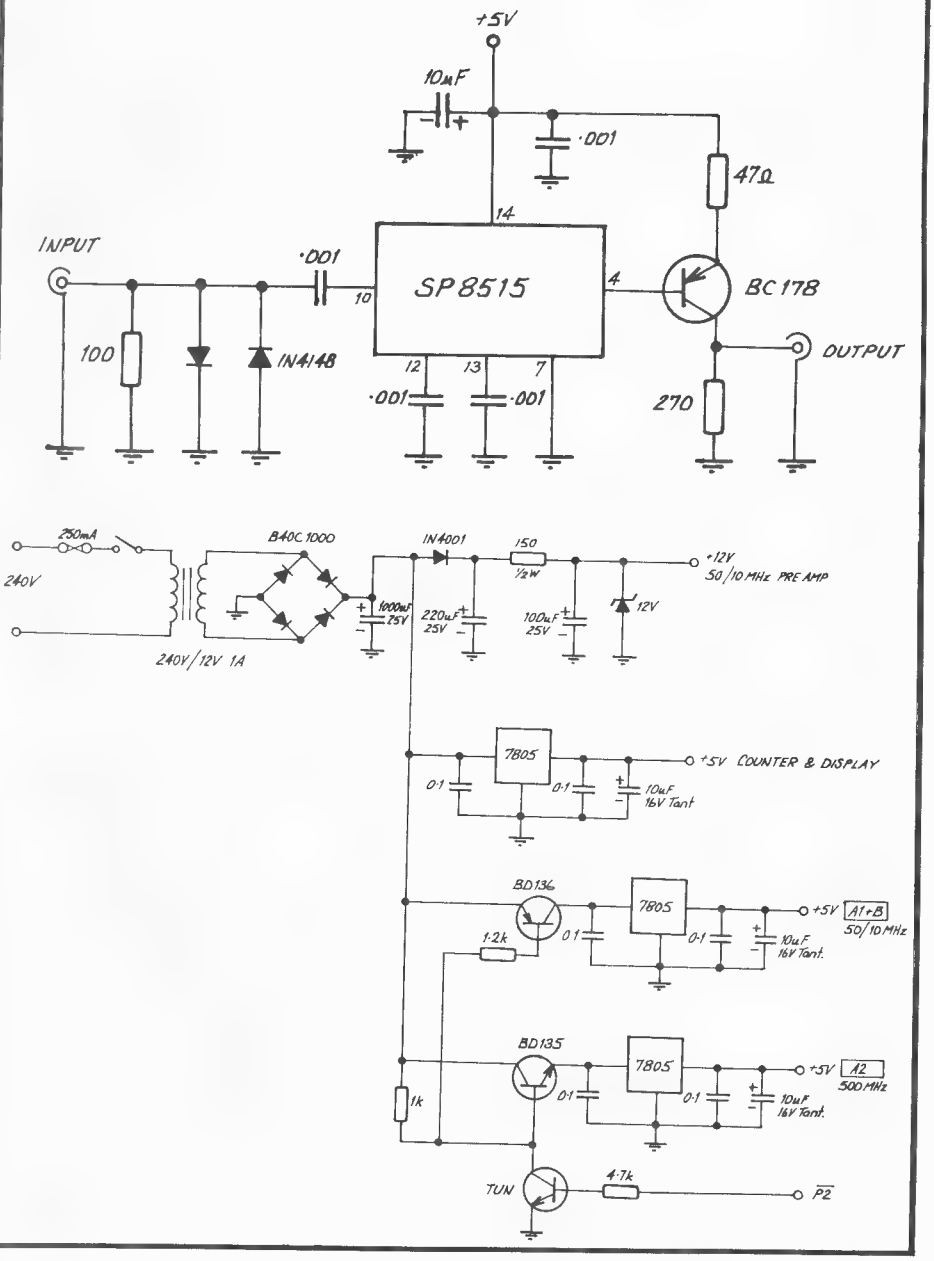


FIGURE 6 (above): Input circuits (A1 and B), 50 MHz and 10 MHz preamplifiers. FIGURE 7 (left): 500 MHz prescaler circuit. FIGURE 8 (below left): power supply circuit.

from spec. by more than 5 per cent). Put all the controls in uppermost position and the mode switch in "OSC" position. The counter should read 10 MHz ± 1 count. The LED display can now be checked by grounding the "LTE" pin. The display should show all eights. If all is correct the input modules can now be connected to the counter. Try and use as high an impedance on the input coax. as possible.

The counter is now ready for setting up and initial adjustment. If you are not going to use the external time base option then the "1 MHz SELECT" should be strapped to ground.

INITIAL ADJUSTMENT

The two resistors marked "R" need to be adjusted and the time base calibrated before use.

The resistors are in the bias networks of the 9582 amplifiers (ECL is very fussy about supply voltages if maximum sensitivity is desired). Connect a 10 kohm potentiometer between the two terminals and turn to its highest resistance. Connect a sine wave source (100 kHz) to the input. Increase the sine wave amplitude until a steady reading is obtained, this should not be more than 200 mV. Decrease the signal strength until the reading just loses stability, then decrease the resistance until stability is restored. Continue doing this until no further improvement can be obtained. Basically this gives a square wave at pin 2 (output) with a minimum of signal. The potentiometer should be replaced with a fixed resistor. Now repeat this with the other 9582 amplifier.

The time base can only be adjusted with an accurate frequency source. The capacitor trimming the time base crystal should be trimmed until the counter shows the frequency of your standard exactly.

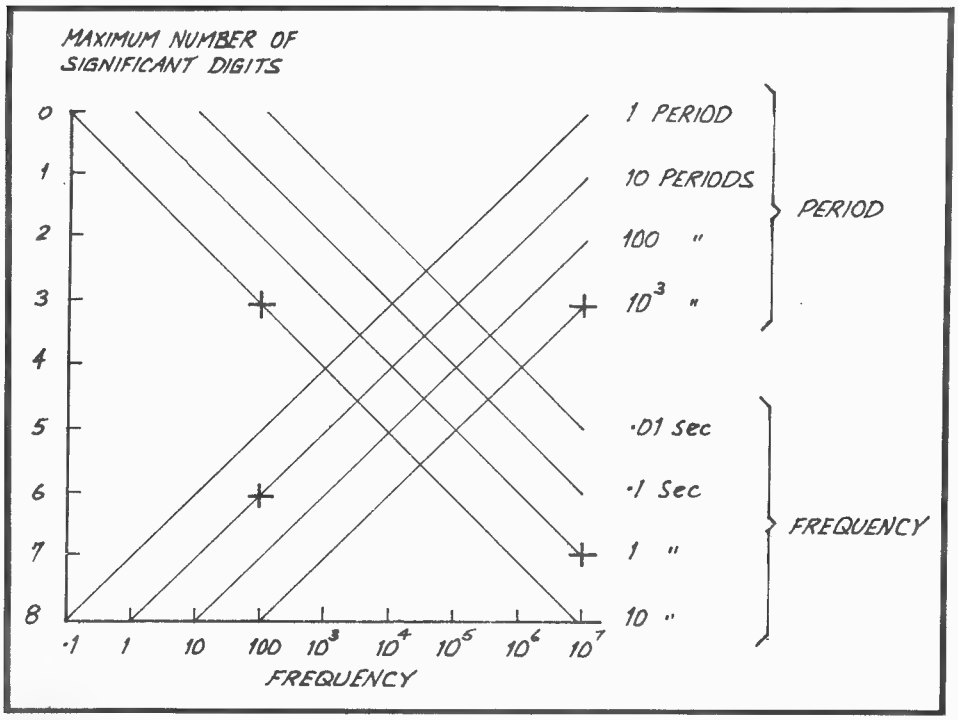


FIGURE 9 (above): Accuracy of frequency and period measurements at different positions of timetable switch.

USING THE COUNTER

The counter can only measure with an error of 1 in the last digit, plus any error in the time base. Because of this it is best to obtain as many significant digits in the display as possible. As an example try the frequency of 100 Hz. The frequency display will only show three significant digits. If instead the period is measured, then six digits are significant (display is in microseconds), so this result is the more accurate. The higher the frequency to be measured, the more accurate the frequency measurement becomes. The graph shows which measurement is going to be more accurate at a particular frequency or period. Frequency is just the reciprocal of period.

EDITOR'S NOTE

It is understood that a kit is available overseas for this project. Enquiries may be directed to the author. The IC7226A is now available as a display kit which may include some parts required for the above counter. ■

PLEASE SUPPORT OUR ADVERTISERS

BAND PLANS

Band plans were published on page 24 of the 1979 Call Book. At the 1980 Federal Convention all amateurs were requested to adhere to these band plans. This applies especially on HF where CW alone is to be used in the CW-only band segments, but can also be used anywhere else on any of the bands. Nothing has yet been decided concerning the proposed new bands at 10, 18 and 24 MHz.

The 1980 Federal Convention also looked at the FM portion of the 70 cm band and agreed on a band plan for recommended uses for repeaters and FM simplex frequencies. These are as follows:

70 cm REPEATER OPERATION

Repeater Input Frequency MHz	Recommended use
433.025	—
.050	—
.075	Mobile voice
.100	—
.125	RTTY
.150	—
.175	—
.200	—
.225	Mob. voice secondary
.250	—
.275	RTTY
.300	—
.325	—
.350	—
.375	Mobile voice
.400	—
.425	Data
.450	—
.475	—
.500	—
.525	Mobile voice Nat. primary
.550	—
.575	Data
.600	—
.625	—
.650	—
.675	Mobile voice Soc.
.700	—
.725	SSTV
434.275	Mobile voice
.300	—
.325	RTTY
.350	—
.375	—
.400	—
.425	Mobile voice
.450	—
.475	—
.500	—
.525	—
.550	—
.575	Mobile voice
.600	—
.625	—
.650	—
.675	—
.700	—
.725	Mobile voice
.750	—
.775	—
.800	—
.825	—
.850	—
.875	Mobile voice
.900	—
.925	—
.950	—
.975	—

Channels with no specific recommended use may be used for any purpose.

70 cm FM SIMPLEX

Frequency MHz	Recommended use
438.750	—
.775	RTTY
.800	—
.825	Voice secondary
.850	—
.875	Data
.900	—
.925	SSTV
.950	—
.975	—
439.000	Voice Nat. primary
.025	—
.050	—
.075	—
.100	—
.125	Voice secondary
.150	—
.175	—
.200	—
.225	—
.250	—

Channels with no specific recommendation and channels between 433.750 and 434.250 may be used for any purpose. ■

QSP

TALLANGATTA RADIO CLUB

Some club details are as follows:—

Club formed October 1978. Number of members 16. Full call members 4. Limited and Novice 5.

Meets 0930 GMT fourth Friday each month at the Tallangatta High School.

Club nets: 3.600 MHz ± QRM at 0930 GMT Friday nights.

For further details write to the Tallangatta Radio Club, 4 Womaatong Street, Tallangatta. ■

A Solid State Keyboard for RTTY

J. McDonnell VK6O
14 Hardio Road, Albany, WA 6330

Having acquired a Siemens T100 teleprinter with a numerals only keyboard, it became necessary to find some way of converting to a full keyboard. A mechanical keyboard was ruled out because of the difficulties in machining code bars, etc.

John VK6JY suggested utilizing a computer type keyboard which was available from Dick Smith under the brand name of Video Brain, which, once the keys were removed and replaced on to a new PCB, gave the basis of the new keyboard. It was found that the markings on the keytops could be readily changed off with steel wool then re-marked with instant lettering and sealed with a clear spray. The layout of the keyboard gives a figure shift at each end of the top row, a space key at each end of the centre row, and a letter shift at each end of the bottom row, but this is a matter of personal preference. Also to preserve keyboard symmetry a NUL key was included which prints no character, but is useful when "waking up" the printer.

The encoding of the keyboard was achieved using germanium diodes off an old computer board scrounged from somebody's junk box. Each character requires a diode for each logic zero plus one to indicate the key has been pressed. The diodes were mounted vertically in a piece of 32 strip veroboard using one strip for each character, the tops of the diodes being joined by six pieces of tinned copper wire, at right-angles to the strips, to give the five bit baudot code plus the key pressed connectors.

The output from the matrix gives parallel data but the printer requires the data in serial form. A circuit in EA for April 1979 was found using half a UART and this was adapted to suit, the biggest problem being setting the clock to the correct frequency. This was achieved by making R2 total approximately 100k using a fixed resistor and a pot in series. The clock can then be set to either 800 Hz (50 Bd) or 727.2 Hz (45 Bd). Problems were encountered with the initiate circuit triggering the UART too soon, so a debounce circuit was fitted to the key press line ensuring that the UART data inputs are programmed before the device is initiated.

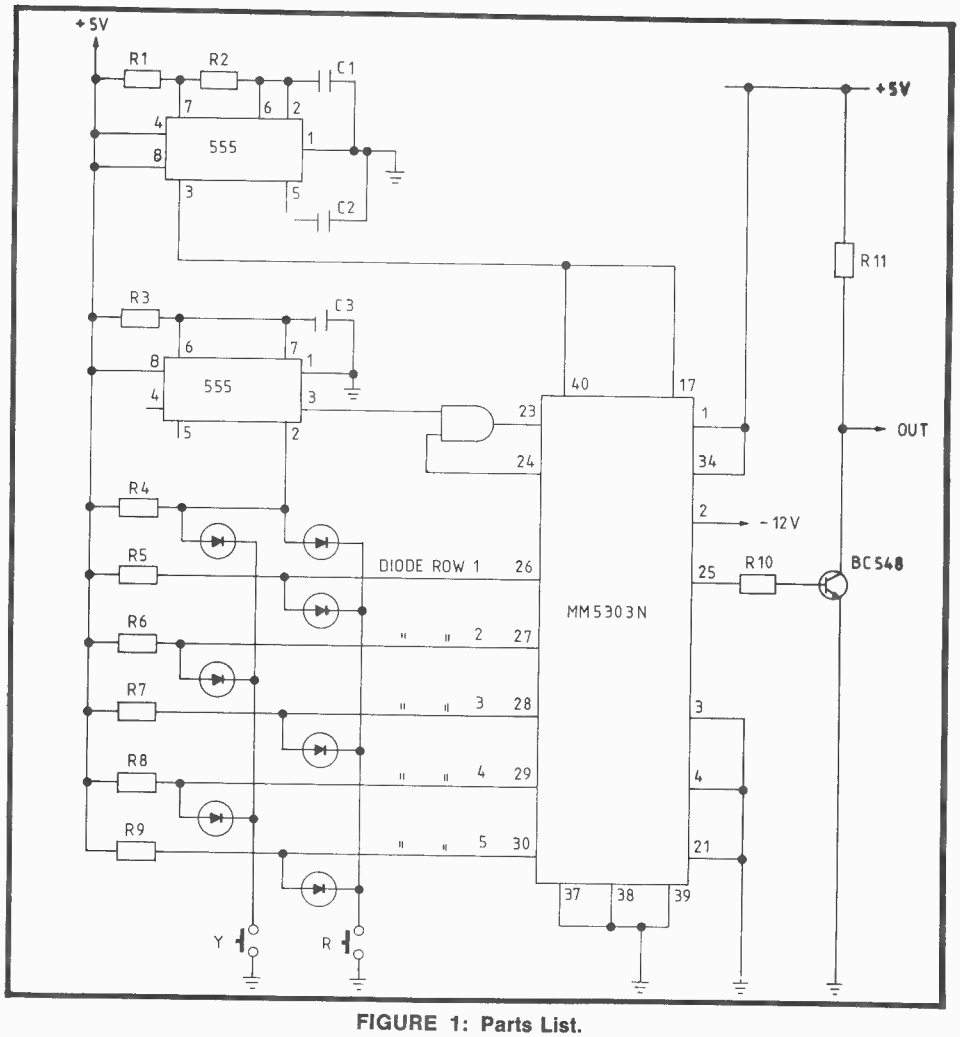


FIGURE 1: Parts List.

PARTS LIST
R1 = 10k
R1 see Note 1
R3 = 10k
R 4 — R9 = 2k2
R10 = 10k
R11 = 1k
C1 — C2 = 0.01 mR
C3 = 1 mF Tantalum
All diodes germanium (e.g. OA90, OA95)
AND gate is 7408
NOTE 1
R2 comprises a trimpot in series with a fixed resistor to total approximately 100k. Adjust the frequency to 800 Hz (50 Bd) or 727.2 Hz (45.45 Bd).

In my case a tin box was built, which was soldered to the back of the keyboard PCB, to house the diode matrix and UART boards. The whole unit then fits in the normal keyboard position. It can, however, be removed and run as a remote keyboard. Using this keyboard the printer always runs in the receive mode so the keyboard must be connected to a sending modulator board and the printer to a receive demodulator with a link between the two boards on transmit to enable the output to be monitored. The same system is used for local loop, the modulator is disconnected in receive mode. Alternatively the UART output can be used to trigger the loop

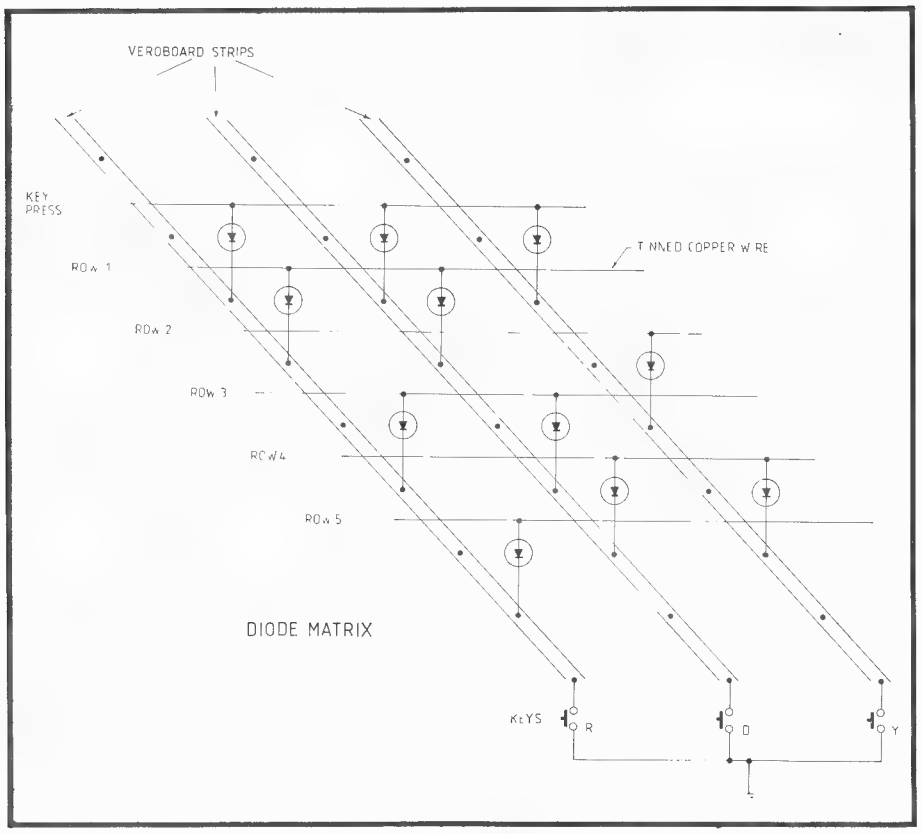


FIGURE 2: RTTY Remote Keyboard.

supply to the magnet using a BC338 or similar, but this does not monitor output on transmit. This keyboard system can also be used remote from the machine or to convert a "print only" device for two-way QSOs.

TECHNICAL EDITOR'S NOTE

A diode should be included to each letter for debouncing, e.g. (Line 2 555 No. 2).

RTTY REMOTE KEYBOARD DIODE MATRIX

Diodes should be fitted where a logic 0 is shown. The chart shows the code with the least significant bit on the right, i.e. diode row 5 is left bit and row 1 is right bit.

Letter	equals	Letter	equals
A	00011	R	01010
B	11001	S	00101
C	01110	T	10000
D	01001	U	00111
E	00001	V	11110
F	01101	W	10011
G	11010	X	11101
H	10100	Y	10101
I	00110	Z	10001
J	01011	Space	00100
K	01111	Carriage return	01000
L	10010	Line feed	00010
M	11100	NUL	00000
N	01100	Letter shift	11111
O	11000	Figure shift	11011
P	10110		
Q	10111		

"NUL" is really a paper tape advance. ■

THE STORE WITH IT ALL
SOFTWARE
TAPES
commodore
VICOM
YAESU
BOOKS
DAWA
ICOM
MACROTRONICS, inc.
bail
TEST EQUIPMENT
MORSE
SERVICE DIVISION
We have a fully equipped electronic service division.
We can service enthusiast and commercial electronic gear efficiently and at a reasonable charge.
Wholesalers, agents, manufacturers and retailers please consider us for your next Queensland service contract.
CW can arrange service and service contracts of Commodore computers within Australia and PNG.
*While current stocks of M65 Last
*Refer to license limitations on Morse and RTTY communications.
CW ELECTRONICS
Cnr. MARSHALL Rd & CHAMBERLAND St,
TARRAGINDI – BRISBANE. Tel: (07) 48 6601 P.O. Box 274,
SUNNYBANK, QLD. 4109 AH: Brian (07) 341 4767 Telex: AA 40811

Home Building

J. A. Gazard VK5JG
39 Glenhuntly St., Woodville, SA 5011

In the early days of Amateur Radio all the apparatus used was home built. There was no other source of supply. By modern standards, the gear was very simple.

In the mid-1920s in Australia a transmitter was most often a self-excited oscillator using one or two receiver power valves and the receiver had a triode detector and one or two audio stages using battery operated valves.

BREADBOARDS

Both the transmitter and receiver were constructed on wooden boards and often a breadboard was purchased for this purpose. The term "breadboard construction" is still used to describe a layout on a single surface.

The cost of parts for this simple station was equal to about five weeks of the average wage at that time. This cost in terms of wages is not far different from the cost of the elaborate SSB transceiver of the present day. The intending amateur first built his receiver as part of his theory study and used it to learn Morse code. The required code speed was 14 w.p.m. in those days.

Although a few commercial receivers found their way to Australia, amateurs continued to build most of their equipment until amateur radio was closed down at the start of the war in 1939.

DISPOSAL ERA

When amateur radio resumed after the war conditions had changed. There were large quantities of war surplus radio gear available and transmitting valves and parts could be obtained very cheaply. War surplus receivers of high quality were also available and many amateurs were able to acquire these receivers. However the surplus transmitters were not so suitable for amateur use and the practice of home building transmitters continued in most cases.

Home building and experimenting was a big part of amateur radio and much talk on the air related to this aspect. Having built the gear himself the amateur had little difficulty in correcting faults and repairing breakdowns, and acquired a good knowledge of amateur radio theory and practice.

SINGLE SIDEBAND

About 1948 the SSB mode of transmission was introduced to amateur radio but as filter parts were not available and construction and adjustment of SSB equipment was difficult only a few ingenious and skilful amateurs were able to build these rigs. As time went on, however, the advantages of SSB became evident. When commercial transceivers specially built for amateur bands became available in the 1960s SSB gradually came into use so that by 1970 SSB was the only acceptable form of radio telephony in the HF amateur bands.

With mass production of SSB transceivers in Japan the price of SSB came within the reach of most amateur so that now almost every amateur operates a commercial transceiver. Newcomers to amateur radio go straight to commercial gear, home building has declined, and an enjoyable part of amateur radio has largely been lost. Whereas in the early days manufacturers sold the necessary parts for home building most of these are not now available.

CW TRANSMITTERS

There are probably many among the newcomers to amateur radio who would like to indulge in home building but are deterred by the complexity of the SSB rigs they see and the lack of parts. Suggestions to these people are that they build a simple CW transmitter and obtain the parts from discarded B and W TV and radio receivers. These old receivers contain most of the parts for a simple full power or novice power CW rig, and they are often given away, so that home building can be carried out at little expense.

At VK5JG it was considered that the use of an SSB transceiver for CW working was uneconomical, and a CW rig has recently been built using old TV and radio parts. This rig has more output than the station SSB transceiver on CW and is now used for all CW work. The SSB transceiver is reserved for telephony, the purpose for which it was designed. The cost of this CW rig was only a fraction of the cost of the previous CW rig built about 1950 and it has about four times the power output. ■

Transmitter PSUs built from Discarded TV and Radio Receiver Parts

The early black and white TV and old valve-type radio receivers which are given away these days contain many of the parts required for building amateur transmitters power supplies.

First there are the power transformers. Those taken from early TV receivers have been:—

1. The type used with 5AS4 rectifiers. These have high voltage secondaries of 500V or 660V CT plus 6.3V and 5V windings.
2. Those used with solid state bridge rectifiers. These have a HV secondary of about 240V plus a 6.3V winding.
3. The type used with voltage doublers, having 110V and 6.3V secondaries.

The lamination size of these TV transformers indicates that they are capable of powering a 150 watt amateur CW transmitter. The first type can be used to supply 600 or 750 watts to the transmitter by using the full 500 or 660 volt secondary to a bridge rectifier. The second can be used to supply 600 volts by feeding the 240 volts to a voltage doubler. The third type is limited to about 300 volts output when used as a voltage doubler but is ideal for a novice transmitter.

RECEIVER TRANSFORMERS

Radio receiver power transformers are also useful. Those fitted in receivers made before 1940 had HV secondaries of about 700V CT but after 1940 this became about 550 volts. (This coincided with the introduction of permag speakers, eliminating the old voltage-dropping field coil.—Tech. Ed.) The largest of these radio power transformers have sufficient power capacity for a novice transmitter but they can also be modified for use as heater and bias supply transformers.

A check on the windings and voltages of transformers can be made by feeding 6.3 volts to the heater winding, which is unmistakeable because of the heavy gauge wire, and measuring the output on the other windings.

PROCEDURE

To modify transformers the laminations are first removed (noting how they are arranged) and the insulation over the windings is stripped. The outer windings, which are the heater windings, are thus revealed and the turns can be counted. If a 6.3 volt winding has 32 turns then the turns per volt are 5. If the transformer is to be modified to give a 6.3 volt heater winding and a 100 volt winding for negative bias then the secondaries needed will be 32 turns for the heater and 500 turns

for the bias. The original heater windings are then removed plus all but 500 turns at the HV secondary. If the original HV secondary supplied 500 CT it will have 2500 turns, so that it will be necessary to remove 2000 turns. Rather than count the turns removed it is easier to count the turns per layer of winding and then count the layers removed.

The ends of the 100V winding can then be soldered to hook up wire leads to bring them out clear of the laminations. The soldered joints should be well insulated and laid back on the windings which are then taped over with three layers of PVC tape. This will ensure that no strain is placed on the fine winding wires when the leads are moved. The new heater windings can then be wound on. Tables in handbooks give the gauge of wire required for heater currents to be used. Laminations can then be replaced, interleaving them as was noted when removing.

FILTER COMPONENTS

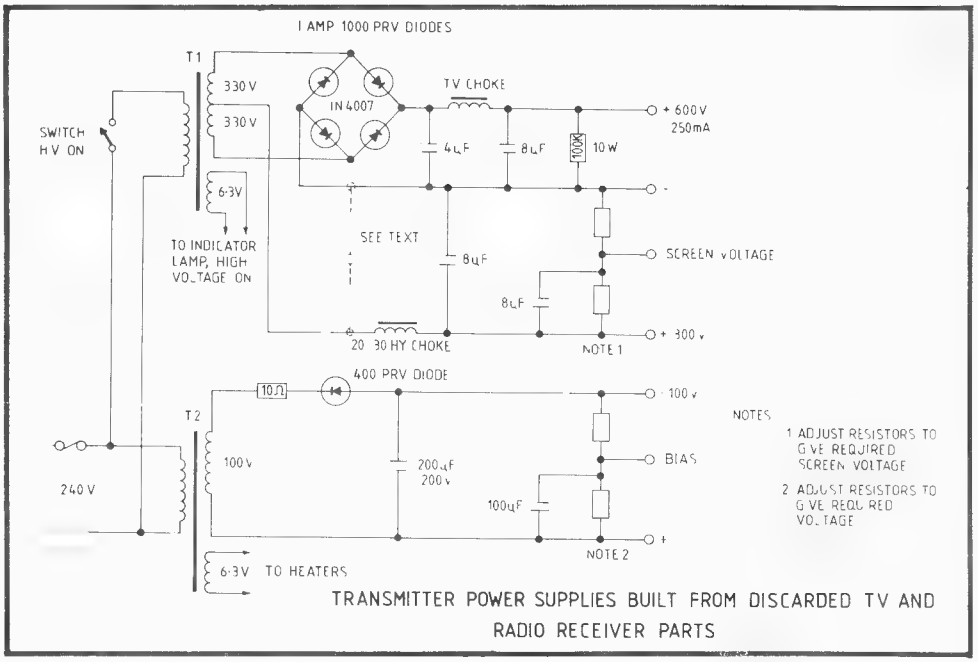
Filler chokes used in TV sets have a comparatively low inductance so that high values of filter capacitors are needed if TV chokes are used in the power supply. TV filter capacitors generally had a working voltage of about 300, so that if these are used they must be connected in series, and parallel balancing resistors must be used. The total capacitor rating should be 1½ times the transformer secondary voltage.

EXAMPLE

The circuit diagram shows how one power supply was made using a TV power transformer and a modified radio transformer. Judging by the lamination area transformer T1 had a capacity of about 200 watts and at 250 mA output to a CW transmitter final it became just warm. A TV choke should not be used to filter the screen supply as it has insufficient inductance to reduce the screen output voltage to 300V. The switching arrangement allows the heater and bias voltages to be applied without plate and screen voltage. This facilitates neutralisation and adjustment of input drive.

By increasing the input capacitor of the HV filter from 4 uF to 8 uF the output voltage was raised to 750V. A similar power supply used a 500V CT transformer. With a 16 uF filter input capacitor and a 32 uF output capacitor this gave an output voltage of 600. In this case it was necessary to provide a filter input capacitor of 2 uF in the screen supply to get 300 volts output.

The 1000V PRV rectifier diodes have a very small voltage safety margin when used with a 660V transformer but the power supply as set out in the diagram has had considerable use without failure. For a greater safety margin each diode could be replaced with 2 in series. ■



TRANSMITTER POWER SUPPLIES BUILT FROM DISCARDED TV AND RADIO RECEIVER PARTS

5m VHF back in the Wireless Horse and Buggy Days — Almost!

A little nostalgia laced with a laugh. Photo shows Al VK4SS up on the Range 900', just west of Brisbane, working 56 megs portable (??) on a VHF Field Day in the 1930s. (He was then in his teens and using the call VK4SA).

The 5mx VHF Band, more than 45 years ago, was mostly a silent space: no commercial gear was available for Hams. To get on air, it all had to be home-brewed. The rig used was a two tube super-regen transceiver, built in a box that previously housed a crystal set. An esthetic touch was added by the use of the main station home-brew mike atop the rig, hi! The latter day Ham has probably never used a super-regen receiver. It operates with a constant low level hiss which disappears when even a very weak signal is tuned.

Al says that it all worked fb but finger-tip tuning was needed or hand capacity QSYd the sig rite off the dial, hi! Note

the extended tuning shaft on main variable capacity to help minimize this effect. Sky hook was a length of 7/22 copper, cut to frequency and strung to the nearby tree. Radiated power would have been a fraction of a watt.

DX worked was approx. 100 Km — down into the Tweed Heads area of NSW, which compares favourably with present-day achievements under no skip conditions. If Al's memory is correct, calls QSOd were VK4AW, VK4WU and one or two other members of the then U gang.

But what Al can't figure is why he found it necessary to turn himself out in a suit, stiff collar and tie for a half-mile slog up the mountain, lumping the gear. Dress sure was conservative in those days. His "wheels", he remembers, was a 1926 Essex, running boards — et al. ■

QSP

INTERFERENCE

An article in one of the well known national newspapers dealt with the problems relating to two Sydney FM stations and complaints by listeners to TV Channel 10 reception. One spokesman was reported as saying that a cheap attachment to the receiver was not the problem which was possibly really one of "harmonious interference". Thanks to VK2BXT for a clipping and who aptly wished that all our TVI problems could be of a harmonious nature. ■

John Moyle Memorial Field Day Contest — Rules 1981

Amateur operators and Short Wave Listeners are invited to make this contest, held in the memory of the late John Moyle, a huge success. Contestants may participate either as individuals or as part of a group. There are two divisions in this contest. The first is for 24 hours continuous operation, and the second for any continuous period of 6 hours. Either period must be within the 26 hours available.

CONTEST PERIOD

From 0400Z 7 February 1981 to 0600Z 8 February 1981.

OBJECTS

The operators of portable field stations or mobile stations within the VK and P2 call areas will endeavour to contact other portable, mobile or fixed stations in VK, P2, ZL and foreign call areas on all bands.

RULES

1. In each division there are 8 sections.

(a) Portable field station, transmitting phone.
(b) Portable field station, transmitting CW.
(c) Portable field station, transmitting open.
(d) Portable field station, transmitting phone, multi-operator.
(e) !Portable field station, transmitting open, multi-operator.
(f) VHF portable field, or mobile station, transmitting.
(g) "Home" transmitting stations.
(h) Receiving portable and mobile stations.

2. In each division, 24 or 6 hours, the operating period must be continuous.

3. Contestants must operate within the terms of their licence.

4. A portable field station must operate from a power supply which is independent of any permanent installation. The power source must be fully portable, i.e., batteries, motor generators, solar panels, etc.

5. No apparatus may be set up on site more than 24 hours before the contest.

6. All amateur bands may be used, but cross band operation is not permitted.

7. Cross mode is permitetd, but note Rule 21.

8. All operators of a multi-operator station must be located within approximately an 800 metre diameter circle.

9. Each multi-op. transmitter should maintain a separate log for each band. A 2 FM rig may be separate from 2 AM or SSB rig, but note Rule 11. A separate QSO number series is required for each band.

10. All multi-op. logs should be submitted under one call sign.

11. Only one multi-op. transmitter may operate on a band at any one time.

12. RS or RST reports should be followed by serial numbers beginning at 001 and increasing by one for each successive contact.

13. **SCORING FOR PORTABLE FIELD STATIONS AND MOBILES.** Portable field stations and mobiles, outside entrant's call area — 15 points. Portable field stations and mobiles within entrant's call area — 10 points. Home stations outside entrant's call area — 5 points. Home stations within entrant's call area — 2 points.

14. **SCORING FOR HOME STATIONS.** Portable field stations and mobiles outside entrant's call area — 15 points. Portable field stations and mobiles within entrant's call area — 10 points.

15. Portable field stations may contact any other portable field station twice on each band and mode (10-160) during the period of the contest provided that at least 4 hours elapse after the previous contact with that station on that band and mode.

16. Stations may be worked repeatedly on 52 MHz and above providing 2 hours have elapsed since the previous contact on that band and mode. Note that FM, AM, SSB and any other voice modes are grouped together as PHONE.

17. Operation via active repeaters or translators is not acceptable for scoring.

18. All logs shall be set out under headings of date-time in GMT, band, emission, call sign, RST sent, RST received and points claimed. List contacts in correct sequence. There must be a front sheet to show — name, address, division, section, call sign, call signs of other operators, location, points claimed, equipment used and power supply. You must also certify that you have operated in accordance with the rules and spirit of the contest.

19. Certificates will be awarded to the highest scorer of each section of the 6 hour and 24 hour division. The 6 hour certificates cannot be won by the 24 hour entrants. Additional certificates will be awarded for excellent performance.

20. Entrants in sections a, b, c, d, e and f must state how power for transmitting is derived.

21. All CW-CW contacts count double. Cross mode contacts count single.

22. Logs to be postmarked no later than 28 February 1981 and sent to FCM, Box 1065, Orange 2800.

RECEIVING SECTION

This section is open to all short wave listeners in VK and P2 call areas. Rules are as for transmitting stations, but logs do not have to show report and serial number of the second station. Logs must show the call sign of the portable or mobile station heard, the report and serial number sent by that station, and the call sign of the station called. Scoring is as shown in Rule 14 for home stations. A station calling CQ does not count. Portable and mobile stations, which must be listed in the left hand call sign column of your log, alone count for scoring. Stations in the right hand column may be any station contacted. A certificate will be awarded to the highest scorer of each of the 6 and 24 hour divisions, individual or multi-operator entries. Certificates will be issued for excellent performance. ■

VK4DO — 57 Years a Radio Amateur

Harold Hobler VKDO
141 Hyde St., North Rockhampton, Qld. 4700

It was in 1913, 67 years ago, that from my seat at the children's kindergarten I went to at that time, I could see through the window, the 162 foot high mast of VIR, Rockhampton, with its cage antennae coming down from a cross-arm at the top of the mast to tie-off points. When I learnt that from these cages messages were sent through the air without intervening wires, I was fascinated.

That day after school, the first thing to do when I got home was to erect a piece of 3 x 2 in the back yard and string some wires down from the top of it (like VIR). A large packing case placed at the bottom served for a room to operate, and with my Dad's help a substitute was made for a morse key. I guess that was my start of interest in wireless. (Radio was not a word then.)

The fascination came again nine years later, in 1922, when a crystal set was my first attempt at construction, after trying to teach myself something about "wireless" from the small amount of literature available at that time. The next year a 3 valve receiver was built, followed by a 2 valve "Lo Loss" type. The size of the wire in the coils would have taken a few kW. A single valve self-excited transmitter was also taking shape. At this time there were no broadcast stations in Queensland. The first one, 4QG, came later. There was only 2BL and 2FC in Sydney, 3AR and 3LO in Melbourne and 6WF in Perth. Broadcasting had just been born and a few B/c receivers were getting into private homes in the Rockhampton area, but static marred reception of the southern stations to a great extent. So to add to the few and far programmes of 1923, a regular Sunday morning programme was transmitted from 4DO on 240 metres, using absorption loop of grid modulation of a single 5 watt UV202 oscillator valve. Some reports came from NZ.

There were no pick-ups in those times. I would wind up the portable gramophone, put on a 78 r.p.m. record, announce what it was, then drop the carbon mike down into the sound box of the gramophone. "B" batteries for the HT of 140 volts became too expensive, so a rectifier was made of aluminium and lead in a borax solution placed in large glass jars. To stop the evaporation of the solution and keep the moths out, a layer of kerosene was floated on top and the moths skimmed off every few days. From this rectifier the output was pretty rough (RAC), so to improve the HT supply a 500V DC generator was acquired, giving a pure DC tone. In 1925 you could pick a station by his tone. (T1 to T7 were common.)

This same year saw amateur radio getting a move on with new sttaions coming on the 80 metre band nightly. I well remember many of them, but many of them are "Silent Keys" now. My AOCP No. 110 was acquired on 1st May, the code speed then being 12 w.p.m. It was in April of this year that G2NM Surrey, G20D Berks, G2LZ Sussex and G2SZ London were heard on 45 metres.

With only a handful of BC stations in Australia in 1924 and 1925, it was possible to hear direct broadcasts from the USA on the broadcast band just around and after dark and many times Henry Halstead's orchestra from KG0, Oakland, California, on 312 and 371 metres, was good strength through the Amplion loudspeaker. In 1926 broadcasting was still a novelty to many up this way, and the Tivoli Theatre asked me about giving a demonstration. With a 6 valve AWA Radiola and home-made amplifier, the 2000 people listened to music from 2BL, Sydney, 900 miles away. Wouldn't like to try it today. This year saw the word "DX" come into the amateur's vocabulary, magazines were being published for the amateur, helping him to construct equipment. Contests were being organised and awards given for long distance, low power contacts. In June of this year, with 140 volts on a 5 watt UV202 valve, my first contacts were made with California, Oregon and Hawaii, for which the Jewell Miles-per-watt Contest was awarded to me for Queensland. The WIA and ARRL (USA) conducted the "1926 Trans-Pacific Tests", which provided for the copying of an official 500 word test message from Connecticut, USA, across the Pacific Ocean. For copying the message, 4DO was awarded an "A" grade certificate; was also made a member of ARRL, and a foundation member of the Rag Chewers' Club of Australia. Trying to get a few more watts in the transmitter, a UX210 tube replaced the UV202, powered by a battery for the filament and the 500V

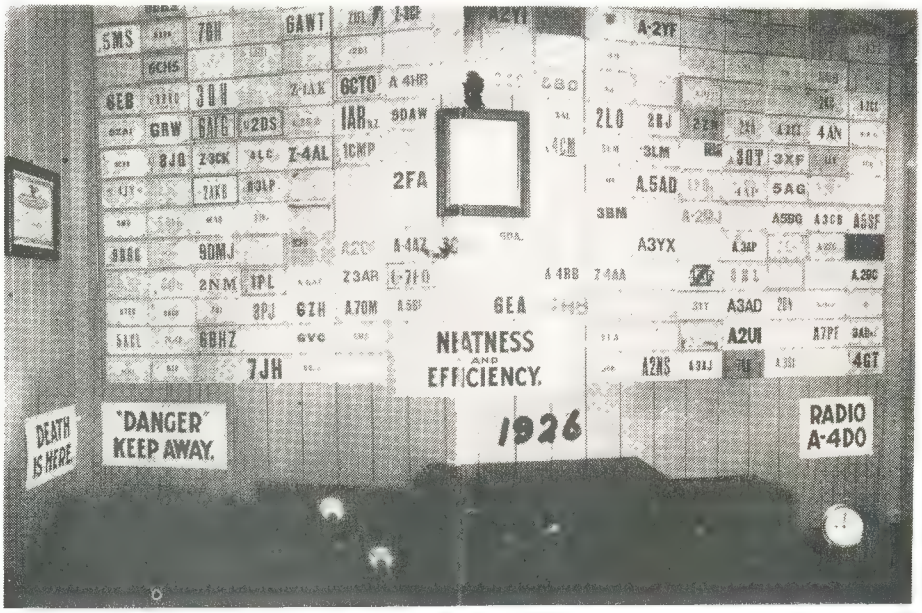


PHOTO 1: Amateur Radio in years gone by — a 1926 view of the station, then A4DO.

DC generator for HT. The coils were made from ¼ in. copper tubing, coupled by sliding along glass rods. The fixed condensers were made from foil and paper taken from T model Ford spark coils; their capacity was never known.

"Lo Loss" receivers were the rage in 1026, so a two valve was made on a breadboard, using a detector and one audio. Another was made on a ¼ in. plateglass panel. Try drilling that stuff some time with a hand drill and rat-tail files. The "B" batteries for the receivers were made up from old battery carbon rods, pieces of zinc, sal ammoniac and "Marmite" jars. I guess we made everything bar the valves.

To supplement my meagre income I wrote a weekly "Wireless Notes" column for the local "Bulletin" newspaper from 1924 to 1940 (16 years), a total of 581 articles, and contributed constructional articles to the "Queensland Radio News" magazine. Still trying to get my morse speed up to 20 w.p.m. by listening to the "sounders" outside the telegraph office, by practice on 80 metres over the air with the original 4AN (Leighton Gibson) of Brisbane, by trying to copy "press" from VIS, Sydney, and ships traffic on 600 metres, eventually in April 1928 was successful in obtaining my First Class PMG Certificate, No. 1003. This entitled me to the position of a ship's operator, and although a position was requested, this chap from Rockhampton was forgotten. However a wireless operator was wanted at Brunette Downs, a cattle station in the Northern Territory, but after being informed that the cabinets turned inside out from the heat and you could not even work Darwin for ten months of the year due to atmospherics, the thought was forgotten. Some of the Novices today think "The Code" is hard to learn. Believe me, it was extra hard in the 1920s, with the nearest other amateur 400 miles away. I remember for the code test for my First Class ticket having to read the sounder in the telegraph office at Rockhampton. The land line was held open and Tom Armstrong, the RI, sent from Brisbane.

It was in June 1928 that the late Sir Charles Kingsford Smith ("Smithy") flew from California to Australia in the "Southern Cross", the first Trans-Pacific flight ever made. From the time "The Old Bus" (as "Smithy" called it) was 4 deg. 10 min. N and 168 deg. 52 min. W until within an hour's landing at Brisbane, messages were copied from the plane and featured in the Rockhampton newspapers. Some time later "Smithy" toured Queensland with the film "The Old Bus" and appeared on stage at my theatre in Rockhampton during the screening. In a chat with him we recounted that epic flight and the messages that came from the 50 watt transmitter aboard the aircraft. The 211 triode was powered by a wind-driven generator on the wing. The transmitter is housed with the "Southern Cross" at Brisbane's Eagle Farm Airport. From 1928 to 1936 equipment was improved, the transmitter being crystal controlled. The "Lo Loss" receiver had been replaced in May 1930 by a pilot "Super Wasp" 4 valver, and this in turn was superseded in May 1936 by the importation from Chicago of a Hallicrafters "Super Skyrider", the last word in receivers in those days. With the old faithful UX210 in the transmitter and 50 watts input, the six continents and then 48 USA States were worked in 1934.

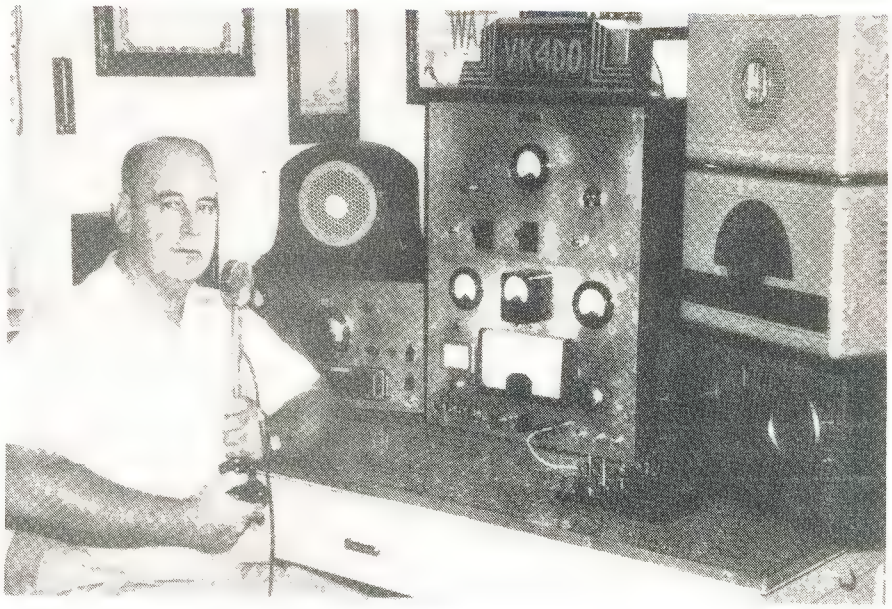


PHOTO 2: Station lay-out and the author in 1962.

The WIA was soliciting members and my Membership Certificate is dated 6 November, 1936. CW and AM were the forms of communication. One would call CQ then tune the band for a reply. 14 Mc was THE DX band and world-wide contacts were regular with a few watts input. Over the years call sign prefixes changed from just 4DO to A4DO, then OA4DO and lastly VK4DO.

September 1939 saw the outbreak of World War 2 and the sealing of amateur equipment from the 2nd of that month until January 1946. By instructing the VDC in morse and signals at the outbreak one did not forget what was so difficult to learn in the 1920s. After hostilities ceased it was difficult to get parts to get back on the air, but gradually war surplus became available and the "Command" equipment allowed many of us to put out a signal once more. Friendships were made again, but "Silent Keys" were missing from the bands. From 1946 it has been a gradual improvement of equipment and antennae, and of course SSB and transceivers have long come into their own, and the VHF bands.

DX work has always had an appeal and I guess I set a challenge to myself some years ago to secure some of the worthwhile awards. With WAC in 1934, WBE in 1935 and WAS (PSA), next were the DXCC secured in 1948 and 1949, and the HARCEN and WAP in 1951. The particular awards I was after were the Worked All Zones for CW, AM, Phone and SSB. Getting the confirmation of the contacts was the trouble but they eventually were received and the three certificates came in 1950 and 1969, followed by the Captain Cook Bi-Centenary in 1970. Participation in contests were rewarding, with two Certificates for the VK-ZL Oceania, eleven firsts for VK4 in the "CQ" World-Wide, five for the Ross Hull VHF and the trophy itself for 1977 and 1979. Worked All Continents has been made many times within an hour, but the best time was in 11 minutes on 5th July, 1973, without any prior arrangement. The Old Timers' Club of USA and Australia saw fit to admit me as a member for my long association with amateur radio. Since the inception of the Boy Scouts Jamboree of the Air we have acted in an operating capacity.

My 57 years as a radio amateur has been a happy and rewarding experience in many ways, and over this period and my over 40 years as a member of the WIA, I have many happy memories of friends I have made and met in Australia and overseas. Twenty years ago a few dedicated amateurs formed the Central Queensland Branch of the WIA, and it has been my pleasure to be associated with them over this period in an official capacity, nine years as President. In 1978 the Queensland Division honoured me with their Merit Badge and Certificate for Meritorious Service to the Institute, and Life Membership was bestowed by the CQ Branch in 1949.

So what more could one ask for, except perhaps to add a few more QSOs to the 76,000 in the log at 4DO's. ■

World-Wide Communications from Hand-Held and Man-Pack Transceivers

Sam Voron VK2BVS
2 Griffith Avenue, East Roseville, NSW 2069
Phone (02) 407 1066 (7 to 9 p.m. nightly)

PART TWO

THE YAESU FT7 AND FT7B MODIFYING FOR 160 METRES

In part one of this series we looked at adapting a state-of-the-art Palomar Transceiver PTR130K into a hand-held HF unit. Unfortunately this unit also carries a state-of-the art price tag which will put it out of reach of some, so let's look at modifying the relatively inexpensive Yaesu mobile units.

The FT7 unit weighs 5.5 kg which, being identical to modern day military man pack radios, makes the FT7 ideally suited for mounting on to a back pack frame.

MODIFYING THE FT7/7B FOR BACK PACK OPERATION

A simple H frame can be obtained from camping and disposal stores; packs can be removed, and the frame, together with shoulder strap, remains. The mobile bracket is mounted halfway up the H frame and the FT7 is vertically secured on to the frame. A Yaesu bumper mount secures on to the top of the H frame and alongside the transceiver an elongated (army walkie-talkie) bag contains the 3 foot Yaesu mobile aerial mast and centre-loaded elements for 80 to 10 metre use. The other side of the back pack holds an antenna matcher (Dentron Junior) and an SWR meter, even though for most elements a very low SWR is obtained without the matcher.

Morse key and microphone are secured on the side of the frame so that they are reachable by the operator.

Power output can be dropped on SSB by decreasing the mike gain or on AM/CW by decreasing carrier control or altering the drive control setting. This conserves battery power.

Current consumption can be dropped by 200 mA by switching off the S-meter lamp and the two main dial lamps by a switch mounted on the back panel. A separate switch can activate one of the back dial lamps when accurate frequency readout is required.

In general operation a frequency is chosen, rig tuned, antenna arranged and the back pack is ready for use. Another idea is to bring the calibrator potentiometer out of the unit via a length of cable to allow some frequency variation by the operator without the need to take off the pack. This modification has not proven necessary in practise.

MODIFYING THE FT7/7B ON TO 160 METRES

No hand-held set-up could be regarded as complete without the advantages offered by the inclusion of the 160 metre band. Apart from the hundreds of experiments possible on this band the range 1.5 to 2 MHz allows the tired walker the opportunity to tune into the local broadcast stations and take advantage of the psychological energy boost obtainable by listening to the latest pop tunes!

Those interested in vehicular operation can of course add 160m to their mobile pleasure.

THE LOCAL OSCILLATOR
(Affects both receive and transmit)

A crystal on 16.0000 MHz will put your rig on the 1.5 to 2 MHz range.

FT7

Mount a switch just above the oscillator board P/O (PB — 1634A) and wire to the 10 metre socket so that either the 10 metre (43.0 MHz crystal) or the 160 metre (16 MHz crystal) can be earthed and so activated. This switch should in addition add a 180 pF fixed and 115 pF mica compression variable capacitor in parallel with the 10 pF trimmer (TC1904).

FT7B

Place the 16 MHz crystal in the 10D crystal socket and solder the above capacitors (see FT7 details above) directly across TC1907.

THE PREMIX STAGE
(Affects both receive and transmit)

Here the local oscillator 16 MHz minus the VFO (5 to 5.5 MHz) provides an output between 10.5 to 11 MHz. To achieve this we must drop the resonant frequency of the 40 metre parallel tuned circuits which currently tune 16.0 to 16.5 MHz.

FT7B

Cut the 10D wire linking across to the other 10 metre terminals on switch wafer S1901g and S1901f.

Connect the 10D terminal to the 40 metre terminal (both on S1901g).

Connect the 10D terminal to the 40 metre terminal (both on S1901f).

Connect two 115 pF variable capacitors on to a tag strip and connect one to S1901g and one to S1901f.

To bring the capacitors into action wire up a switch which will earth the other end of the capacitor thus effectively adding capacitance across the 40 metre coils and dropping the resonant frequency as required.

FT7

Arrange to switch out the 10 metre coil and switch in the 40 metre ones. Then carry out the two capacitor additions to 40 metre coil T1902 connected to wafer swtich S1901g and S1901i.

THE PREDRIVE INPUT COILS
(Affects both receive and transmit)

These coils proved to be too difficult to resonate. A .01 uF capacitor was placed between the two wafer contacts and the series tuned circuits ignored.

FT7B

Free both 10D terminals on S1901h and S1901i from the 10 metre link and place a .01 uF ceramic capacitor between these terminals.

FT7

The two terminals which need to be bridged by the .01 uF are S1901j and S1901k.

PREDRIVE OUTPUT COILS
(Affects only transmit)

FT7B

Free the two 10D terminals from the 10 metre links on wafers S1901k and S1901j.

Connect the 80 metre coil link turn to the 10D position on S1901k.

Connect the 80 metre parallel tuned circuit to the 10D position on S1901j.

Connect a 115 pF variable capacitor with a fixed ceramic equivalent of 172 pF across it on to a tag strip and connect one end to S1901j.

To bring the capacitors into action wire up a switch which will earth the other end of the capacitors thus effectively adding capacitance across the 80 metre coil and dropping its resonant frequency down to 1.8 MHz.

FT7

The two wafers involved are S1901m (equivalent to S1901k in the FT7B) and S1901l (equivalent to S1901j in the FT7B).

RF FRONT END COILS
(Effective on receive only)

FT7B

Free the two 10D terminals from the 10m links on wafers S1901l and S1901m.

Connect the 80m parallel tuned circuit to the 10m position on S1901l.

Connect the 80m coil link turn to the 10D position on S1901m.

Connect a 115 pF variable capacitor with a 220 pF fixed ceramic across it on to a tag strip and connect one end to S1901l.

To bring the capacitors into action follow the previous switch earthing procedure.

FT7

The two wafers involved are S1901n (equivalent to S1901l in the FT7B) and S19010 (equivalent to S1901m in the FT7B).

LOW PASS FILTER UNIT

FT7B

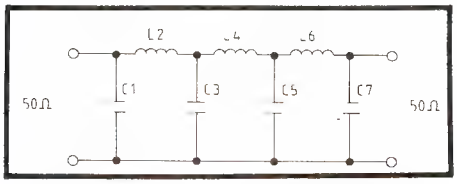
Free the two 10D terminals from the 10m links on wagers S2a and S2b.

Run a coax cable from these terminals into the LPF unit PB1880 and connect to the new 160m LPF.

FT7

Wafers involved are S2102a and S2102b. LPF unit is PB1636.

The new 1.8 MHz low pass filter required is as follows:—



L2 and L6 = 19 turns 22 gauge 1 in. dia. toroid or nearest size available.

L4 = 20.9 turns 22 gauge 1 in. dia. toroid or nearest size available.

C1, C7 = 1000 pF.

C3, C5 = 2400 pF.

This filter circuit came from an excellent article in QST (December 1979, page 45).

Insulation tape over existing LP filters allows the new filter to be placed on top of the existing filters if toroids are mounted horizontally.

ALIGNMENT

LOCAL OSCILLATOR

Switch on the marker. On the LSB mode tune the VFO either side of a 100 kHz point. If the marker carrier is not heard (a weak heterodyne) then vary the 115 pF capacitor. If still no go, vary oscillator coil T1901 and the 115 pF capacitor until oscillation occurs. Check all other bands to verify that their crystals are also oscillating reliably. The marker should be heard on each band by tuning the VFO. Adjust T1901 so that all bands are oscillating OK.

Unreliable oscillation may be due to a low activity crystal. A source of readily available untried 16.000 MHz crystals is currently advertised for $4.90 by Rod Irving Electronics, 499 High Street, Northcote, Victoria 3070.

For specially made 16 MHz crystals specify HC25/U type, 30 pF load capacitance, 25 ohm or less series resistance, 7 pF or less static capacitance, 5 mW drive level.

PREMIX STAGE

Tune the VFO to 1600 kHz and on the SSB mode heterodyne against the marker carrier. Adjust the 115 pF trimmer (connected to S1901g in the FT7B and FT7) for maximum S reading.

Now tune the VFO to 1900 kHz and, using the same procedure as above, adjust the other 115 pF trimmer (connected to S1901f in the FT7B or S1901i in the FT7) for maximum S reading. Repeat this procedure until maximum response is obtained. If a signal generator is available alignment could be carried out on 1650 kHz and 1850 kHz.

PREDRIVER INPUT COILS

No alignment is required since direct capacitive coupling is used.

PREDRIVE OUTPUT COILS

Use a power meter sensitive down to 100 milliwatts and a dummy load. Set the VFO to 1825 kHz and controls for maximum CW transmit output. Adjust the 115 pF trimmer for maximum power output; vary the transceiver's tune control to ensure maximum output. Under 3 watts with no low pass filter will be typical.

RF FRONT END COILS

With the VFO on 1800 kHz and the marker carrier running adjust the 115 pF trimmer for maximum S-meter reading. This reading should be near +20 dB over 9 if your modification has been successful.

LOW PASS FILTER UNIT

Swap input and output connections to find the best results. Output should be 1 to 2 watts.

THE LOW POWER OUTPUT

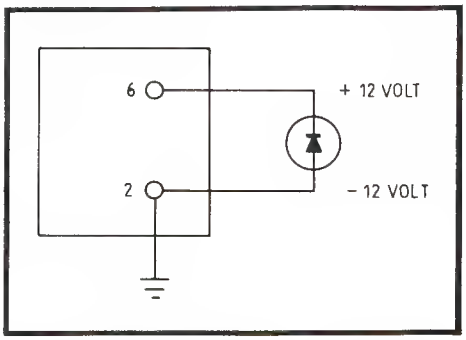
This power level is ideal for my hand-held, providing S9+ reports across Sydney. I have been unable to raise the power level. If anyone finds an easy method please write to my address and I will pass on the information to those needing higher power in mobile and home station situations.

IMPROVING AM RECEIVE QUALITY ON THE FT7B

Add a 1 pF capacitor between the input and output of the filter XF301 type 9M20A on filter unit PB1873A. Listen to that hi-fi AM now. Just beautiful!

DROPPING CURRENT CONSUMPTION BY ANOTHER 100 mA ON THE FT7B

The FT7B draws 100 mA extra on receive compared to the FT7 because of relay RL2. Deactivate RL2 and wire so that the 12 volt supply via the on/off switch is connected directly to the heavy wires on the relay contacts. You must now add a polarity protection diode across the power socket J6.



Polarity protection diode across power socket.

Note that you should not exceed 3 amps as indicated by the front panel meter, since removing the relay limits the amount of current we may draw otherwise wiring or switch may be damaged.

A 160 METRE HAND-HELD OR BACK PACK ANTENNA

The Yaesu 80 metre resonator can be easily turned into a 160 metre antenna by connecting a 40 pF variable trimmer from the top of the resonator to earth. Removing the trimmer returns the antenna back to 80 metres.

A wire with two lugs on each end is all that is required to change bands. The lug fits nicely on to the screw thread near the top of the resonator.

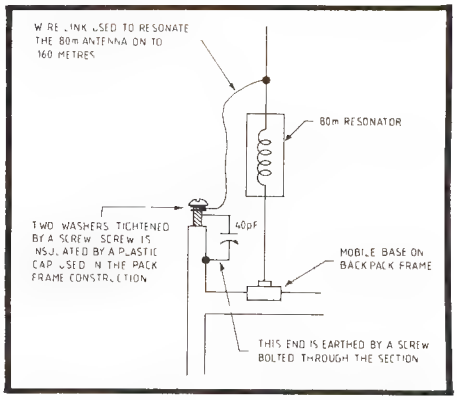

WIRE LINK USED TO RESONATE THE 80m ANTENNA ON TO 160 METRES
80m RESONATOR
TWO WASHERS TIGHTENED BY A SCREW. SCREW IS INSULATED BY A PLASTIC CAP USED IN THE PACK FRAME CONSTRUCTION
40pF
MOBILE BASE ON BACKPACK FRAME
THIS END IS EARTHED BY A SCREW BOLTED THROUGH THE SECTION

FIG. 3. Adding 160m to your Yaesu 80 to 10m mobile antenna system.

ADJUSTMENT

Tune receiver to 1825 kHz on a stormy night or at least when static crashes from hundreds of miles away are being propagated. Adjust 40 pF trimmer for maximum S-meter deflection. Your 1:1 SWR 160 metre antenna is now ready for use. ■

(To be continued)

PENSIONERS

*

If you believe you are entitled to a WIA pensioner grading —

PLEASE

clear this matter direct with

YOUR DIVISION

as **early as possible.**

Your subscription rate is based on your WIA grade — check your AR address label.

SUPPORT OUR ADVERTISERS

VHF-UHF

An expanding world

Eric Jamieson,
VK5LP
Forreston, S.A. 5233

VHF/UHF BEACONS

Freq.	Call Sign	Location
50.005	H44HIR	Honiara
50.055	ZL1UHF	Auckland
50.100	KH6EQI	Pearl Harbour
50.105	KC4AAD	McMurdo, Antarctica
50.110	KH0AB	Saipan
50.144	KC6NI	Ponape, Caroline Is.
51.999	YJ8PV	Vanuata
52.150	VK5KK	Arthurton *
52.200	VK8VF	Darwin
52.250	ZL2VHM	Palmerston North
52.300	VK6RTV	Perth
52.330	VK3RGG	Geelong
52.350	VK6RTU	Kalgoorlie
52.400	VK7RNT	Launceston
52.435	VK3RWV	Hamilton *
52.440	VK4RTL	Townsville
52.450	VK2WI	Sydney
52.500	JA2IGY	Mie
52.500	ZL2VHM	Palmerston North
52.510	ZL2MHF	Mt. Climie
52.800	VK6RTW	Albany
52.900	VK6RTT	Carnarvon
53.000	VK5VF	Mt. Lofty
144.010	VK2WI	Sydney
144.162	VK3RGI	Gippsland
144.400	VK4RTT	Mt. Mowbullan
144.475	VK1RTA	Canberra
144.500	VK6RTW	Albany
144.600	VK6RTT	Carnarvon
144.700	VK3RTG	Vermont
144.800	VK5VF	Mt. Lofty
145.000	VK6RTV	Perth
147.400	VK2RCW	Sydney
432.400	VK4RBB	Brisbane
432.450	VK3RMB	Mt. Bunningyong *
10.3 GHz	VK6RVF	Perth *

No additions to the beacon list this month. Advice should be given at the time of writing the VK5 beacons are off the air for a rebuild, but hopefully will be back on by the time you read this. Changes will include a new keyer for FSK mode, antenna overhaul, and return to usual power. It is not known at this stage if there will be any frequency changes.

BEACON FREQUENCIES

From time to time discussions, mostly on air, are initiated at least in VK5 on the merits or otherwise of the suggested bandplan for the various beacons, particularly on 2 metres. Two matters which are generally aired as being problems are (1) that at least in the case of the VK5 beacons they are located in such a prime position as to be received so strongly at various places in the metropolitan area that overload and mixing problems exist, and (2) having a very strong beacon so close in frequency to other beacons in other areas makes it difficult to hear the other beacons, if they are weak, as they generally are.

Let us look at these two matters in a little more detail. It is certainly true that in some of the better areas of the Adelaide metropolitan zone the 2 metre beacon in particular is exceedingly strong, and were it not for the fact that it is located 700 kHz above the calling frequency of 144.100, would be even more embarrassing. I guess it would be also fair to say that in some cases faults do exist at the amateur installations with poor conducting surfaces on antennae, etc., which can cause rectification and other problems. And the design of some equipment is open to question in its capability of operating in the presence of strong signals without overload and consequent generation of spurious signals. Accepting all these factors must of necessity lead one on to thinking that, as a general rule, strong permanent signals should not be too close in frequency to the usual operating areas of stations who in the first place were believed to receive some benefit from having a beacon anyway.

This fact then leads us to the second question of where the beacons should operate and how close together. I know there have been many band-plans proposed in the past, and there is supposed to be a plan prepared by the VHFAC to which it is hoped we would be adhering. On the present positioning of the 2 metre beacons, one wonders how many people in Canberra whose beacon operates on 144.475 would ever hear the beacon in Albany on 144.500 if such propagation existed, which is probable some time in the past. Similarly, would amateurs in Hamilton (beacon 52.435) be likely to hear VK4RTL (52.440) in Townsville at times perhaps other than good Es periods?

I suppose I will be accused of stirring, but despite having probably done as much as anyone in VK to help in the establishment of the Australia-wide beacon network, not once have I ever been asked for an opinion regarding operating frequencies. Blubber! Blubber!

If anyone would care to write to me I would like to know how VK2 amateurs in the Sydney area close to VK2WI on 144.010 work their DX, and do the Sydney gang hear VK4RTL on 52.440 when their own beacon is on 52.450? And do the Darwin boys find VK8VF embarrassing on 52.200 when the 6 metre band is open to other areas? How does VK3RGI on 144.162 affect the Gippsland boys for 2 metre working on 144.100? Do the Geelong boys still hear VK7RNT on 52.400 now they have a beacon on 52.330?

The problem in VK5, of course, is compounded because in working over the Mount Lofty Ranges into VK3, which is the most common interstate path, amateurs on the Adelaide plains look right at the beacons on the top of Mount Lofty, hence 30 watts into an antenna with a few dB of gain being received on the front of a large 2 metre beam with plenty of dB of gain can spell disaster. So what do we do? If the beacon was on the plains it wouldn't be heard interstate very often, and I can't imagine anyone being pleased to have it next door to them. Or do we put it on the other side of the Ranges where it will be constantly heard in Victoria but may not serve its purpose of being an indicator of band openings? In my own case the 2 metre beacon is more than 40 dB over 9 but I don't have to look through it, so it would be very easy to dismiss the matter as not being a problem; but I am aware of some difficulties existing and that's why I am asking some of you to write with feedback on your own situations. Thank you.

A LOOK OVER SIX METRES

The very high solar counts of the past month or so have produced some interesting contacts, despite the A and K index not being to our best advantage.

One of the better prizes would have to go to **Joe KG6DX,** who on 3/11 heard the **I5TDJ** Italian beacon on **50.318** at **S9+** from **0815 to 0915Z!** Not really being content with this he also heard the Jamaican beacon **6Y5RC** at the same time!

The best prize must go to the Japanese stations who worked **EL2FY** in Liberia on 4/10/80, time 2200 to 2400Z, area JA1. Similar conditions existed on 6, 7, 8, and 9/10 to JA3, 4, 5 and 6! Statements were made to the effect that it seems the contacts may have been made via the long path pointing South East; if this is so the distance seems to be in excess of 13,000 miles. The path would have extended over the top of New Zealand. **Hide JA2DDN** reported the ZL and VK TV video was copied on 46 MHz during the openings.

Although now confirmed it seems **ZD8TC** in the **Ascension Is.** south of Liberia may also have worked the Japanese stations, but **ZD8TC** did work **EL2FY** over the local 1400 mile distance. Signals were **599** on 10/10 at 2300Z.

About the same time it appears **KH6IAA** worked into **W6** along the west coast of USA on 144, 220 and 432 MHz via tropo. On 24/10 **KH6IAA** also worked **VK5ZPW** at 0845Z at 5 x 9, also to VK2 around 0830Z.

Es contacts have been becoming more frequent starting to VK4 on 7/11. The **VK3OT** beacon is being heard quite a lot, and up to **5 x 9 plus 40 dB** at **VK5ZPW.** More Es on 13/11, 14/11 spasmodically to VK2 and VK4. On Saturday 15/11 VK4 again, and heard that **Ross VK4RO** had worked into VE7 and W7. **VK4RTL** beacon in for most of the day, mostly about S2. On 15/11 JAs were noted calling Worked All States during the morning, and using the long path to everywhere! Also reported **Phil VK2BYX/4** had heard and been heard by **VE1SIX** but not able to make contact.

On 16/11 more Es, this time to VK3 and VK7 during morning period in VK5. VK2WI beacon in and out of noise. Band opened to JA around 0412Z for half an hour but signals generally were 5 x 3. Areas noted were JA1, 2, 3, 4, 7 and 8. Strongest signals from a **JA8** and **JI1IXW** to S7. Same stations also working into VK4 same time.

Report to hand of ZL working into KL7 Alaska and as far inland at Fairbanks — not a bad effort! Also heard the **P29SIX** beacon has been testing on 52.013 and should be operational by the time you read this, but on another frequency, not known at this stage. Thanks to **VK5ZBU, VK5ZRO** and **VK5RO** for filling in the information gaps.

A LETTER FROM VK4DO

Hal has written to say JA signals were becoming more consistent towards the end of October, and up to 3/11 had more than 100 contacts. Interesting figures for the last four years of six metre contacts by VK4DO with Japan, from February to November each year are as follows: **1977,** 12; **1978,** 1333; **1979,** 1534; **1980,** 1551. All with 40 watts SSB to home made transverter, and 4 element yagi 8 metres high.

JARL advise their WAJA Award is on its way to Hal for 2-way 52 MHz SSB QSOs with every one of the 47 JA Prefectures. All have been worked on 52 MHz CW as well, but he still awaits three confirmations for this one. Congratulations, Hal, I am sure they will be awards well earned.

NEWS FROM NORTHAM

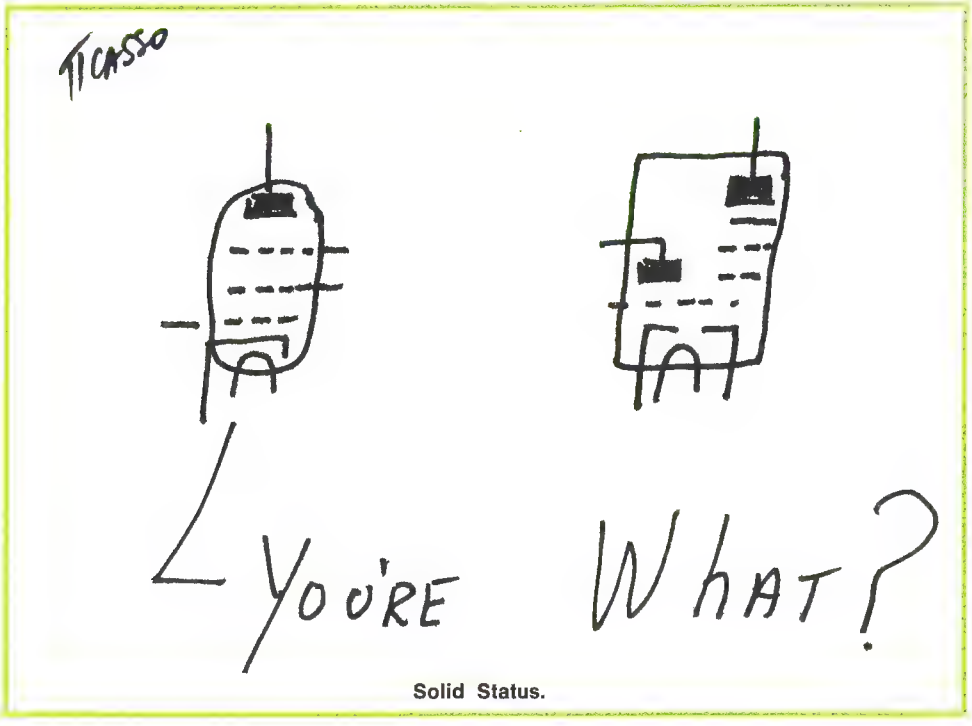
Tony VK6BV has written outlining the VK6 activity for October. 7/10: 0515Z on and 12/10 0430Z on — reception of 49.750 TV sound. 13/10: 0317Z VK5VF beacon. 0340Z worked **VK5ZPE** and **VK5AGM. Wayne VK6WD** worked VK5 from 0325 to 0340Z during which time the signals went over Northam as they were inaudible. 0545Z: JAs on 50 MHz. 1200Z: Coastal ducting on 2 metres to Carnarvon. Due to transverter failure at the critical moment not able to work VK6OX, who was 5 x 9 at time. He did work Perth though.

14/10: 0415Z 49.750 TV, 1200Z JA worked in Perth. Closed 1340Z. 15/10: 1200Z JA again into Perth. 16/10: 0415Z TV again, 0530Z JAs on 50 and 52 MHz. 1200Z JAs on 52 MHz, but weak and fluttery. 17/10: 0510Z TV. 0930Z JAs on 50 MHz. 19/10: 0730 TV on 49.750 and JAs on 50 MHz. 0805Z worked JA5 and JA2 until 0810Z. 1001Z worked JA2, 4 and 5 until 1020Z. 25/10: 0505Z JA1 and 4 until 0520Z. 28/10: 0630Z first good opening to Japan with signals S9+ both ways. **JA2IGY was 539.** Band closed 0459Z after working JA1, 2, 3 and 7.

Observations: Noted that during October signals from Japan have been of equal strength on 50 and 52 MHz, with the odd day stronger on 52 MHz. There were still days when the usual pattern applied. VHF antennae up at the moment are an 8 element yagi on 6 metres at 17m in height, on 2 metres a 16 element yagi at 20 metres, and on 70 cm a 13 element yagi at 18.5 metres. Thanks for your letter, Tony.

HIGHER THAN SIX METRES

13/11: **VK5ZRO** worked **VK5ZMJ** 1208 to 1323Z on **70 cm** over **110** miles path with signals 5 x 9 + 20 dB, which then led to an opening across to Albany on 14/11 when **VK6XY** was worked at 1200Z on 2 metres SSB, followed by **VK6KJ** and **VK6** on **144** and **432** MHz. It was open to VK3 also at the same time, as conditions brought about the very large high pressure system across the southern areas. **Bob VK5ZRO** has only recently come on 432 MHz so was a pleased man.



Solid Status.

MOONBOUNCE REPORT

Lyle VK2ALU in "The Propagator" reports on the **VK2AMW EME Station:**

"The dish was dismantled at its Dapto site and transported to its new site on the weekend of 18/19 October. The 30 foot parabolic reflector made the move in one piece after it had been separated from its counterweight assembly and lifted off the support tower.

"The journey was made by road early on the Sunday morning before there was much traffic about. There was very little room to spare on some of the narrower sections. No damage was caused by the move, which is a tribute to the expertise of the haulage contractor.

"The major components now rest on platforms where they will be checked carefully, any corroded steelwork replaced and all then repainted ready for erection on its new concrete foundations, yet to be poured.

"As much work still has to be carried out by the university staff and by whichever amateurs would like to help, it is expected it will be a number of months before we are operational again.

"The vandals struck again a few weeks before the move when they removed the 20 foot long tubular feed supports from the parabola. As these were of duralium for strength and lightness they may not be easy to replace."

ELECTRIC SHOCK FROM CAPACITORS

As the VHF fraternity are probably the most likely to be engaged in constructional projects using high grade capacitors, I thought the following printed in "The Propagator" and taken from "A Safety Handbook for Science Teachers", by Everett and Jenkins, is relevant, and worth including here.

"High grade capacitors and, in particular, large energy storage capacitors as used in pulsed capacitor banks, will recover a considerable proportion of the original charging energy if left on open circuit after discharge. This phenomenon is known as the 'residual effect', 'dielectric hysteresis' or 'dielectric absorption' effect and a capacitor is said to have an 'absorptive capacity'.

"Experience has shown that recovery may be as much as 10 per cent of the original voltage, and a 30 kV capacitor may build up to 2 or 3 kV in 10 minutes. Further, dangerous voltages can build up on open-circuited high voltage capacitors over a period of many months after discharge.

"It has been found that a discharge of energy exceeding 10 joules into the human body can be hazardous to life, while 0.25 joules gives a heavy shock. Ten joules would be obtained by complete discharge of a capacitor charged as in the following table:

CAJACITY (UF):					
0.002	*0.2*	*20*	*80*	*320*	*2000*

CHARGED TO (kV):

100 10 1 0.5 0.25 0.1

"It is essential that each spare or disconnected capacitor should be kept individually short-circuited by a robust connection when not in use.

"It should also be remembered that 'new' capacitors have already been energised for test purposes, and should also be kept short-circuited when stored. Capacitors built into equipment which is not in use must similarly be short-circuited individually, otherwise hazard may exist when they are connected in series or if there is a circuit fault when in parallel."

TECHNICAL KINK

There are still plenty of QQE06/40 valves around and being pressed into service as SSB linears for 2 metres where they perform very well. With 600 volts or 700 volts on the plate if you are venturesome and 250 volts on the screen are fine. Sometimes instability can be encountered if you are using RF controlled switching when it seems the screen is capable of oscillating. Just touching the screen with a meter probe will stop the oscillation.

This seems to happen in those circuits where the screen is fed from a dropping resistor from the HT+. Quite often the oscillation can be cured by fitting a 10 uF capacitor right at the screen pin, or if you want to be more precise why not fit a Philips 3-30 pF trimmer at the screen pin and adjust for neutralisation.

CLOSURE

It's only a fortnight since the last epistle, so the end comes up now. May I wish all my readers a very happy year in 1981, with plenty of DX and a chance to purchase or build that new piece of equipment you have been wanting for so long.

LATE NEWS

15/11: **VK4RO** worked **VE4, W0 and W9** this morning. Also heard by **VE1.** 16/11: **VK9ZG** worked in Brisbane.

Thought for the month: **"Worry is like a rocking chair — a lot of action, but you don't get very far."**

73. The Voice in the Hills. ■

SMIRK UPDATE

The following list of new SMIRK members is provided for the interest of those looking for SMIRK members amongst their six metre contacts.

SMIRK membership is available to anyone who contacts the required number of SMIRK members. In our case three. You then send $4 to the Secretary, **Ray Clark K5ZMS, at 7158 Stonefence Drive, San Antonio, Texas 78227,** together with log extracts of the contacts.

JG1WGI	3894
JH1KGX	3815
JI1OKK	3754
JI1UHZ	3747
JI1UJE	3816
JJ1HOD	3890
JJ1XUM	3895
JK1IQI	3893
JK1PTQ	3793
JK1TXK	3755
JL1BAX	3854
JL1LNS	3814
JL1WYE	3852
JL1XJD	3892
JM1EUQ	3891
JE2RDR	3899
JF2CXH	3753
JF2FYH	3777
JF2ITL	3874
JF2PLR	3873
JF3SVD	3853
JG3PCE	3786
JA7ARH	3851
JH7JNF	3881
JH7VGI	3882
JH7VGJ	3883
JH7UWZ	3880
JR7ODA	3790
JR7RFE	3791
JA8GSZ	3826
JH8CUJ	3827
JA9WPW	3792
VK3AT/LH	3809
VK9XT	3806
VK9XW	3807
VK9ZG	3861
H44OT	3862
YJ8OT	3808 ■

Cockies' Net Second Birthday Get-Together

In July, 1978, a group of WA farmers ("cockies"), who were also amateurs, decided to meet on air once a week to chat and discuss mutual problems and interests. Thus was formed the "Cockies Net".

The net is on 3.575 MHz at 1300 hrs Z each Sunday evening. Generally four or five stations join in, and sometimes quite a lot more. The net is in no way restricted to "cockies", but the general tone of the conversations is definitely rural! All that is asked of participants is an interest in rural affairs generally.

Amongst the regular net operators are **VK6BS, VK6XM, VK6KG, VK6NOM, VK6NYL, VK6NTM, VK6UW and VK6XJ,** with others at various times. It is understood that the net is quite ppoular with the SWLs.

To celebrate the second anniversary of the "Cockies Net" Basil VK6BS and his wife Mary invited all net operators to a get-together on their farm at Manmanning, some 200 km north-east of Perth, on Saturday, 2nd August, 1980.

Not everyone could attend, but there to meet each other, some for the first time, were Malcolm VK6XM, Brian VK6NOM and his wife Bev VK6NYL, Terry VK6NTM, Bert VK6NJB, Don VK6UW, John VK6XJ with Margaret, and Basil VK6BS, of course.

(Left to right): Dave (friend of Basil's), Malcolm VK6XM, John VK6XJ, Bev VK6NYL, Brian VK6NOM, Terry VK6NMT, Bert VK6NJB, Don VK6UW and host Basil VK6BS.

The day was a most happy and enjoyable one, and it looks like becoming an annual event, with operators taking turns at hosting the occasion.

See yer on the Cockies Net.

VK6XJ. ■

SIDEBAND ELECTRONICS ENGINEERING

"THE ANTENNA AND ROTATOR SPECIALISTS"

P.O. BOX 23 SPRINGWOOD NSW 2777
WAREHOUSE 213 HAWKESBURY RD. SPRINGWOOD
TELEPHONE (047) 54 1392

DO YOU OBJECT TO HUGE PRICE INCREASES?

If so, read on. We offer a 5% or better price reduction from now until 31st January 1981. Offer applies to all current stocks except for a few Trio-Kenwood items. For previous prices see November AR and ARA Vol 3 Issue 6.

ANTENNAS

TET HB35C	was $415	now	$390
CUSHCRAFT A3	was $325	now	$290
HY-GAIN TH5-DX	RRP $447	now	$420
HY-GAIN TH3-JR	was $250	now	$237
HY-GAIN 18-AVT/WBa	was $125	now	$115
HY-GAIN 8el 2M	was $40	now	$37
HI-GAIN 14 el 2M	was $50	now	$47
HY-GAIN GPG-2	was $30	now	$25
HELICALS	were $25		
10-15-40-80M w/adjustable tip		now	$20
20M w/adjustable tip EXTRA SPECIAL		now	$15

CONNECTORS & ACCESSORIES

PL-259	were .75c	now	.50c
GLP Rt angle	were $1.50c	now	.75c
MLS Rt angle	were .75c	now	.50c
CABLE JOINERS	were .75c	now	.25c
M-RING body mount	were $1.50c	now	.75c
SWR METER	was $25.00	now	$20.00
ASAHI Bumper mount	was $8.00	now	$6.00
STANDARD Bumper mount	was $5.00	now	$3.00
SPRING MOUNT	was $15.00	now	$13.00
240V/2 x 9V transformer	was $8.00	now	$6.00

ROTATORS

CDE T2X	was $300	now	$285
CDE HAM-IV	was $225	now	$210
CDE BT-1A	was $110	now	$100
KEN KR-400	was $140	now	$130
KS-065 BEARING	was $30	now	$25

HENRY LINEARS

2KD-5 2KW	was $1000	now	$950
1KD-5 1200W	was $800	now	$750

YAESU MUSEN PRODUCTS

FT-101ZD W/FAN	was $850	now	$810
FT-707 SERIES			POA

CABLE

RG-8U COAX PER METRE	was $1.20	now	$1.10
RG-58U COAX PER METRE	was .50c	now	.45c
CONVERSION XTALS	were $32.00		$25.00
BN-86 BALUN	was $25.00	now	$23.00
HI-Q BALUN	was $15.00	now	$14.00
SHINWA 10W UHF 3 CH 450-477 MHz COMMERCIAL TRANSCEIVER NEW			$375.00

STOP PRESS!

LATE SEPTEMBER – HUSH HUSH MEETING INTERSTATE AMATEUR RADIO DEALERS HELD SYDNEY STOP SYDNEY DEALERS EXCLUDED STOP "SMALL WONDER" SYDNEY DEALERS INCENSED STOP **OCTOBER 1** – PRICE INCREASES ANNOUNCED STOP TS-130S NOW $847 STOP **NOVEMBER 1** – SYDNEY DEALERS TO THE RESCUE STOP SOON AVAILABLE FROM SYDNEY DEALERS ONLY AT PREVIOUSLY QUOTED PRICE:

TS-130S $750

KEN WOODHOUSE – VK2TKA?

EAT YOUR HEART OUT!

TRIO-KENWOOD EQUIPMENT

R-1000 RECEIVER	RRP $541	now	$480
TR-7200G TRANSCEIVER 2M	was $160	now	$150
TR-7625 TRANSCEIVER 2M	was $325	now	$315
R-599 RECEIVER W/SPEAKER		now	$325
VP-1 MOBILE ANT. MOUNT	RRP $45	now	$35
MC-501C MICROPHONE	RRP $31	now	$25
SP-180 SPEAKER W/FILTERS	RRP $73	now	$60
TV-502 TRANSVERTER	RRP $326	now	$250
RD-300 DUMMY LOAD	RRP $87	now	$75
LF-30A FILTER	RRP $35	now	$30
DK-520 ADAPTOR	was $10	now	$5

All prices are NET, ex Springwood NSW, on pre-payment with order basis. All risk insurance is free of charge, allow for freight charges by air, road, rail or post, excess will be refunded. Prices are subject to change without prior notice. All orders cleared cleared on a 24 hour basis after receipt of order with payment.

Proprietor – ROY LOPEZ (VK2BRL)

FORWARD BIAS

VK1 DIVISION

(Postal Address: WIA (ACT Division) Inc., PO Box 46, Canberra, 2600 ACT)

JANUARY 1981 MEETING

This will be held on the third Monday, the 9th, and not the 26th. The topic, and we'll have a guest speaker for this one, is the Defence Integrated Security Communications Network (DISCON).

ANNUAL GENERAL MEETING

In accordance with the Division's Constitution, our annual general meeting will be held on Monday, 23rd February, 1981, at 8 p.m. at the Griffin Centre. The ordinary business will be:

- to receive from the Committee, Auditor, Federal Councillor, Public Officer and other officers, reports on the Division's transactions and business during the 1980 financial year;
- to elect the officers and committee members for 1981;
- to elect Federal Councillor; and
- to appoint the Auditor and determine his remuneration, if any.

Nominations of candidates for election as officers of the Division or as committee members must be in writing, signed by two members of the Division, who are holders of current Australian amateur radio transmitting licences, and accompanied by the written consent of the candidate. The nomination is to be delivered to the Public Officer at least ten clear days before the date of the annual general meeting — hat is by Friday, 13th February, 1981. Nomination forms will be available at the January meeting.

SLOW MORSE BROADCASTS

These take place each Sunday evening after the broadcast on 10 metres (28,490 kHz). Fred Robertson-Mudie VK1MM wants to hear from members and obtain their views on these morse sessions. In particular, he wants to know how the 1981 programme should be arranged. Are the Broadcasts to continue? If so, do members want them on bands other than — or in addition to — 10 metres? So, you would-be candidates for the 1981 series of OACP and Novice tests, get in touch with Fred. ■

VK2 MINI BULLETIN

Output Freq.	Call Sign	Location, Owner
6625	VK2RPI	Maitland (RTTY), Maitland PIRC
6650	VK2RDX	Oberon, St. George ARS
6700	VK2RPM	Pt. Macquarie, Oxley Region ARC
	VK2ROA	Orange, Orange ARC
	VK2RMU	Milton, Mid. Sth. Cst. ARC
6750	VK2RAG	Gosford, Central Cst. ARC
	VK2RFS	Eden/Bega, Far Sth. Cst. ARC
	VK2RWG	Wagga, Wagga ARC
6800	VK2RLE	Sydney - South, St. George ARS
	VK2RIC	Lismore, Summerland ARC
6850	VK2RAW	Wollongong, Illawarra ARS
	VK2RAB	Gunnedah, Gunnedah ARC
	VK2RGF	Griffith, Griffith RC
6875	VK2RMB	Sydney - North, M. Warringah DRC
6900	VK2RAN	Newcastle, Hunter Branch C
6925	VK2RGL	Sydney - North, Gladesville RC
6950	VK2RMI	Moree/Inverell, North West ARG
7000	VK2RWI	Sydney - North, WIA NSW Div.
7050	VK2RBM	Springwood, Blue Mtns. ARC
7100	VK2RWR	Lake Macquarie, Westlakes ARC
7250	VK2RNS	Sydney - North, Hornsby ADARC
7350	VK2RHR	Mittagong, Sthn. H'lands ARS

NOTE:
Offset in 146 MHz is 600 kHz **down,** above 147 MHz, 600 kHz **up.**

8225	VK2RUW	Wollongong, Illawarra ARS
8525	VK2RUS	Sydney - North, WIA NSW Div.

NOTE:
Offset 5 MHz **down.**

The Gosford UHF repeater is to move to **8075.** Applications from the following areas are for VHF repeaters — Coffs Harbour, Tamworth, Nowra, South West (Cootamundra) and Gilgandra. Applications for UHF repeaters have been received from Newcastle (2), Gladesville and Blue Mountains.

Details of six clubs affiliated with the NSW Division.

PARKES AND DISTRICT AMATEUR RADIO CLUB

247 Clarinda Street, Parks 2820.

Meetings: 2nd Tuesdays, Red Cross Rooms, Parkes.

President: R. Swindley VK2DDQ. Vice-President: J. Mowtell VK2BMJ. Secretary: T. Darcy VK2DD. Other Committee: B. Nash, P. King VK2VJQ, P. Scarlata VK2YRO, W. Field VK2NNF.

Club call sign: VK2BPK.

ORANGE AMATEUR RADIO CLUB

Box 1065, Orange 2800.

Nets: Sundays, 8.30 p.m. on rptr. ch. 6700 using VK2AOA. Sundays, 8 a.m., on 3615 kHz using VK2BVW.

Meetings: 1st Fridays, 7.30 p.m., at Orange Technical College.

Classes: Fridays, 7 p.m., at Kinross-Wolaroi School, Orange.

President: P. Carter VK2TK. Vice-President: K. Stevens VK2ASY. Secretary: R. Wilson VK2BRC. Other Committee: M. Cridland VK2VDJ, B. Carroll VK2DEQ, J. Clifford VK2DDN, E. Hicks VK2VOH.

Repeater: VHF VK2ROA channel 6700 at Orange (Fred).

ST. GEORGE AMATEUR RADIO SOCIETY

Box 77, Penshurst 2222.

Nets: Sundays, 8 a.m. on 3555 kHz using VK2LE/P. Tuesdays, 7.30 p.m., on 14110 kHz, 8 p.m. on 28520 kHz using VK2LE/P. Thursdays, 8 p.m., rptr. ch. 6800 using VK2LE/P.

Meetings: 1st Wednesdays at 7.30 p.m., Scout Hall, James Street, Blakehurst.

Classes: Tuesdays at SES Hall, Highgate Street, Bexley. NAOCP. Tuesdays at Engadine. AOCP.

President: D. Sellars VK2AZS. Vice-President: J. Button VK2NPA. Secretary: E. Carruthers VK2AQF. Other Committee: K. Conolly VK2DKC, D. Richardson VK2NRV/YIK, P. Smith VK2ZSA, A. Hartley VK2NNJ/ZIH.

Repeaters: VHF VK2RLE, channel 6800, at Heathcote, 30 km SW Sydney. VHF VK2RDX, channel 6650, at Mt. Bindo, near Oberon.

Newsletter: "Dragnet", available at monthly meetings.

Subgroups: Computer group and WICEN.

TAREE AMATEUR RADIO CLUB

PO Box 712, Taree 2430.

Net: Mondays, 1000Z, on 28.48 MHz using VK2NCK.

Meetings and classes: 6.30 p.m. Wednesdays at Chatham High School.

President: G. Hunziker VK2BGF. Vice-President: C. Withers VK2BVI. Secretary: M. Stahl VK2VPQ. Other Committee: J. Pinson VK2VOP/YMU, L. Gerity VK2KT.

ILLAWARRA AMATEUR RADIO SOCIETY

PO Box 1838, Wollongong 2500.

Nets: Sundays, 8.30 a.m., on 52.525 MHz. Sundays, 8 p.m., on 28.46 MHz.

Meetings: Second Mondays, 7.30 p.m., at the Congregational Hall, Coombe Street, Wollongong.

Classes: Fridays, 6 p.m., at Wollongong Technical College.

President: K. Curle VK2OB. Vice-President: D. McKay VK2DMR. Secretary: J. Doherty VK2NHA. Other Committee: G. Cuthbert VK2ZHU, G. Donk VK2VPD, R. Dorin VK2VOE, L. Kirchmajer VK2ALK, D. Meyers VK2PBP, I. Squires VK2DKS, K. Kennedy VK2DAN.

Newsletter: "The Propagator", Editor B. Wade VK2AXI, issued monthly.

Repeaters: VHF VK2RAW, channel 6850, at Robertson, 20 km SW of Wollongong.

Approximately 500m above sea level. UHF VK2RUW, channel 8225, testing at Warilla, 15 km S of Wollongong.

MANLY WARRINGAH DISTRICT RADIO CLUB

PO Box 186, Brookvale 2100.

Nets: Monday-Friday, 7.30 a.m. and 5 p.m., on rptr. ch. 6875.

Meetings: Wednesdays, 7.30 p.m., at Old RAAF Radar Station, Warringah Road, Beacon Hill. Lectures on 3rd Wednesdays.

President: J. Blackman VK2YIM/NTO. Vice-Presidents: G. Aggett VK2GD, C. Jackson VK2TD. Secretary: I. Dodd VK2DLU. Other Committee: R. Clarke VK2BYN, R. Tremble VK2BIS, P. Angilley VK2BDF, R. Grigson VK2RA, D. Wheeler VK2ZHV, S. Platt.

Repeater: VHF VK2RMB, channel 6875, at Beacon Hill, 15k N of Sydney, on 11 metre mast.

PUBLICATIONS

Some time in January or February, Divisional Office should receive a new delivery of ARRL books, including USA and Foreign Call Books. Listen to broadcasts for details.

QSL BUREAU

Have YOU notified the NSW QSL Bureau, c/- PO Teralba 2284, what to do with your cards? The QSL Manager, Bill Hall VK2XT, has many thousands of cards waiting for information from both members and non-members as to their distribution.

COMING EVENTS

22nd February (Sunday). Gosford Field Day at Gosford Showground. Write to Box 238, Gosford 2250, for a programme.

26th February (Thursday 10 a.m.). Close of agenda for AGM.

7th March (Saturday 10 a.m.). Close of nominations for 1981 Council, NSW WIA.

22nd March (Sunday). Liverpool Field Day at Catherine Fields. More next month.

28th March (Saturday 10 a.m.). AGM of NSW Division at 14 Atchison Street, Crows Nest. Proxy forms for members unable to attend can be obtained by sending SAE to Divisional Secretary, Box 123, St. Leonards 2065.

News for inclusion in VK2 Minibulletin must reach Box 123, St. Leonards 2065, by the first of the month prior to publication.

Susan Brown VK2BSB. ■

QRK5

A monthly transmission from the Victorian Division WIA.

Written and co-ordinated by VK3WW, QTHR.

WILLY WILLY'S WORDS

Congratulations to all who passed the various exams in November. I expect there will be a lot of new voices on 2 metres FM when I return to Melbourne and a few "old" voices with new labels. Welcome all.

ON THE REPEATER

It is a good idea and indeed good manners to maintain a set sequence when in a group QSO. Unless you have an emergency don't call out of turn.

MONDAY MORNING MUMBLE

This title has been given to the 8.00-8.30 a.m. session which tries to establish a new subject each week. Recently we have heard discussion on sport, Dr. Who and K9, nostalgia (radio), nostalgia (serials), Australian poetry, science fiction books, etc. For those who prefer to be on their TOD (technical only discussion) there is the other repeater. Unfortunately two regular Monday mumblers have been chastized for TOD on channel 2, while two Toddies used channel 5 for a Monday mumble!

Confused? So am I.

ADDRESS IN REPLY

The letter prominently displayed in the November column drew a lot of comment, which proves some do read QRK5. A reply was sent to the Editor in time for the December issue, but due to some strange trick of fate was referred back to me. In all fairness, regardless of content, I think it should receive equal prominence. The unedited letter follows.

"

The Editor,
Dear Sir,
It is obvious that your correspondent VK3NWO has no sense of humour. I fail to see how anyone could take offence at the QRK5 column in AR of September 1980.

Mike VK3WW is well known for his sallies at "Sacred Cows", and what is any more sacred about the Novice licence than any other grade?

The Australian Novice is on clover. In New Zealand the Novice licence is for 12 months only, and is **NOT** renewable. The holder must upgrade during this period. Perhaps an excellent idea for us too. The US Novice may use CW only.

I feel that the whole article was written tongue in cheek and was not a slight on either class of licence. It is suggested that your correspondent get rid of that chip on his shoulder and enjoy Amateur Radio — its triumphs, its problems, its comradeship, and its pleasures.

Thanks, Mike, for an interesting and stimulating column.

Yours faithfully,
John O'Rorke VK3ZFA.

"

The QWAFT award has proved most popular, particularly when presented on Thursdays. Recently awards were made to a couple of old thugs — John VK3AJI and Graeme VK3NE?, also to a new thug, Jim VK3YZW, who travelled all the way from Morwell to receive his award and to qualify for "full" membership.

THE CONVENTION

All readers will now know of the VK3 Convention planned for February 28/March 1. A lot of very enthusiastic people are working to make this a success. Please give them the support they deserve.

73. Mike. ■

R. I. P.

SOMEONE ELSE

The club was saddened to learn of the death this week of one of the club's most valuable members, Someone Else.

Someone's passing creates a vacancy that will be difficult to fill. Else has been with the club since its beginning. He did far more than a normal person's share of the work.

Whenever there was a job to do, a class to teach, a committee to be chaired, or a meeting to attend, one name was on everyone's lips — "Let Someone Else do it".

It was common knowledge that Someone Else was among the largest contributors of his time to the club; whenever there was a need for volunteers, everyone just assumed Someone Else would volunteer.

Someone Else was a wonderful person — sometimes appearing superhuman, but a person can only do so much. Were the truth known, everybody expected too much of Someone Else.

Now Someone Else is gone! We wonder what we are going to do. Someone Else left a wonderful example to follow, but who is going to do the things Someone Else did? When you are asked to help, remember — we can't depend on Someone Else!

From Worldradio August 1980. ■

QSP

VK2 after some considerable delay will be operating a 10m beacon. It will be located with the present 6 and 2m beacons at VK2WI Dural. It will commence on a test frequency of 28.335 MHz and change in the new year to 28.270 MHz.

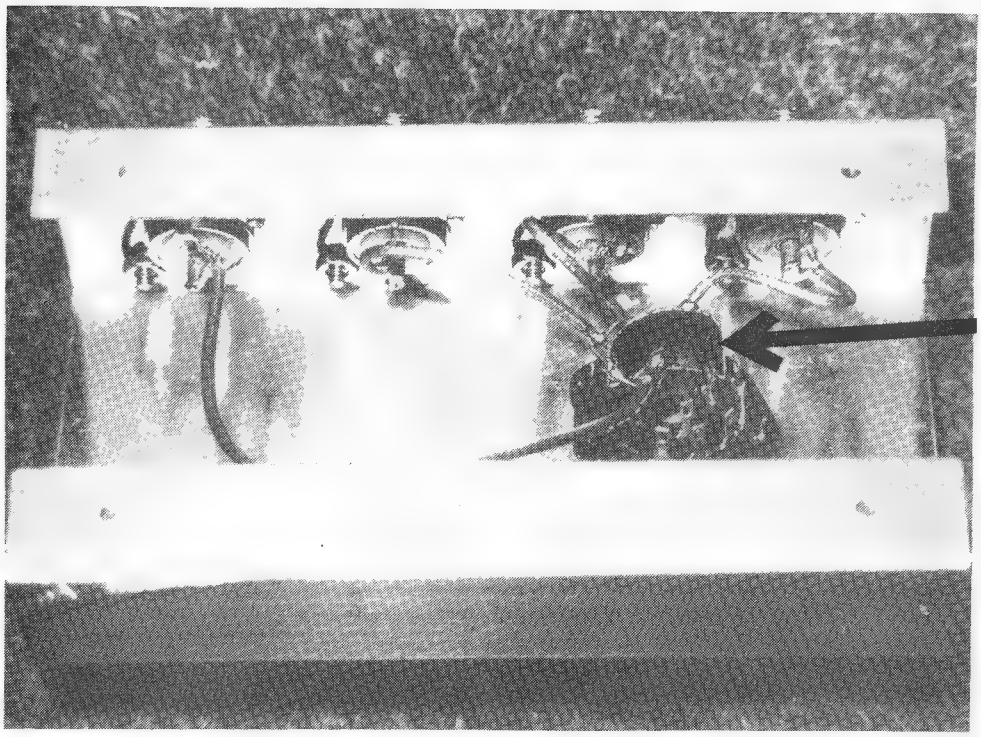
The present 6 and 2m beacons will be rebuilt in the new year and the equipment will also serve the dual role of providing the SSB broadcast signal. The 2m frequency will change to comply with the national band plan. ■

HERITAGE OF OMAN — SINBAD

A note and brochure received from Joe McElvenney A4XIC, of Oman, gives details of the projected voyage of the dhow "Sohar" under Nahodha Tim Severin, who led the successful voyage of the oxhide skin boat from Ireland to North America in 1976/7. The voyage of the "Sohar" is sponsored by the Omani Ministry of National Heritage and Culture and approved by the Sultan, whose financial assistance makes the venture possible. The voyage begins in Oman to mark the 10th National Day of the Sultanate in November 1980 desination China using early Arab sailing techniques in order to investigate the origins of the Sinbad legend. Calls are expected to be made in the Laccadive Is. (mid-Dec.), Malabar Coast, Maldives (mid-Jan.), Sri Lanka, Andaman and Nicobar Islands (Mar./Apr.), Malacca, Singapore, Sumatra, Hong Kong and Canton. On board research programmes will be conducted by a team of marine scientists and full radio facilities will be installed using the call A4XSV/MM but the voyage is not a DXpedition. ■

COMMERCIAL KINKS

RON FISHER
VK3OM
3 Fairview Avenue, Glen Waverley 3150



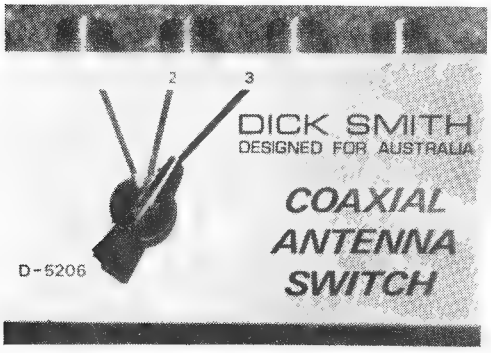
The modified switch. Arrow shows the small screen added.

KEEPING THINGS CLEAN

Several years ago in this column, I discussed several aspects of cleaning and keeping clean amateur radio gear. My observations over the intervening years have confirmed that Mr. average amateur hasn't changed. He still keeps his gear in rather dirty condition. But for those of us who are fussy about the appearance of our equipment and like to keep that showroom shine, I have discovered a new preparation that really makes old gear look new. It is called ARMOR ALL Protectant. An American preparation, it is sold by motor spart parts houses and also by the larger supermarkets. Give it a try, you will be delighted. But first make sure that the equipment is clean.

Now for a change of subject. Our Technical Editor, Ron Cook VK3AFW, has come up with an easy modification to improve the performance of a popular coax switch. Over to Ron.

Dick Smith sells a very useful coaxial antenna switch at a quite reasonable price. Unfortunately, although the switch's performance is satisfactory up to 30 MHz, the performance at 144 MHz is not acceptable. Photo 1 shows the switch.



The Dick Smith antenna switch.

Removing the cover showed the problem. The connections from the switch to the coaxial connectors were made with heavy stranded hook-up wire. This was removed and replaced with 50 ohm coaxial cable. A solder lug was fitted to each socket and the braids soldered to the appropriate lug. The braids at the switch end were soldered to a short length of tinned wire. This may be seen in Photo 2. Also shown in this photo is a small screen (arrowed). Although this may not be necessary it was fitted to reduce and minimise capacitive coupling across the switch. The screen was cut from sheet copper and held in position by soldering to the wire connecting the braids. This is shown in the photo.

The coaxial cable used was the teflon insulated cable which is sold by Dick Smith. It is thin and easy to work with. RG58 could also be used.

Before the modification, placing the switch in a matched line produced a VSWR of 2 : 1 at 146 MHz. After there was negligible change when the switch was introduced.

VK3AFW. ■

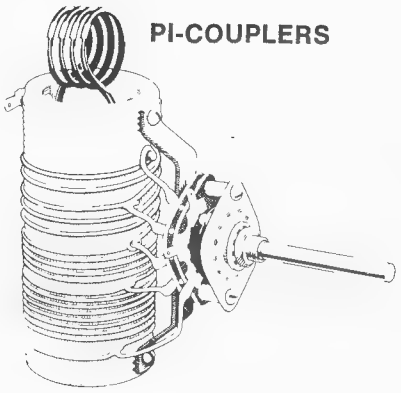
INCREASED GAIN FOR THE IC22S

Next a simple modification to the popular IC22S. Eric VK3ZSB has improved receiver performance in two ways. The first is to remove the shunting effect of R1 on the front end. This 150 ohm resistor is in parallel with the receiver RF input and shunts the incoming signal. The low value is needed to operate the RF switching diodes D1 and D2. In order to reduce the shunting effect on the signal, snip the resistor pigtail and slip several ferrite beads on to it and then resolder. A short piece of wire might be needed to lengthen the lead. The effect of this is to raise the impedance at RF and reduce the shunting effect of the resistor. An improvement of about 2 dB can be expected and this will make many previously marginal signals readable.

The second modification requires no actual work at all with a soldering iron and will increase the readability of weak signals whilst mobile, by increasing the IF gain and allowing limiting to take place. A small penalty is that the "S" meter will read somewhat higher on weak signals.

The modification is simple. Turn the trimpot R23 to the maximum position. Weak signals will now produce useful limiting with a consequent improvement in readability in the presence of noise. ■

PI-COUPLERS



WILLIS MEDIUM POWER TYPE

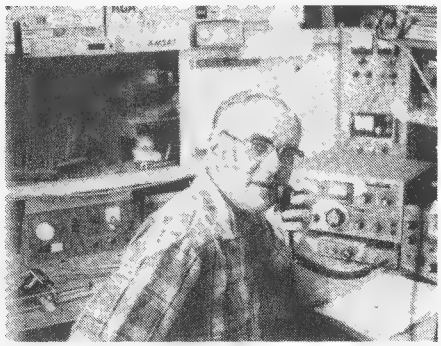
For use up to 600 watts p.e.p. Match plate loads of 2,000 to 3,500 ohms (Z) and higher into co-axial cable. Operating Q increases on higher frequencies to increase harmonic suppression, enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for winning inductance (L). Incorporating extra switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps. at 2,000 volts with contact resistant (R) of 0.8 milli-ohms.

Suggested for use in **"A LINEAR POWER AMPLIFIER FOR AUSTRALIAN CONDITIONS** (Refer "Amateur Radio", April, May & June issues, 1976).

PRICE: $29.00

William Willis & Co.
PTY. LTD.
Manufacturers and Importers
98 CANTERBURY RD., CANTERBURY VIC., 3126 **Phone 836 0707**

AMATEUR SATELLITES



R. C. Arnold VK3ZBB

Due to the editorial deadlines for the holiday period it is only a few days since I was preparing the notes for the December issue of "Amateur Radio" and in the intervening period there has been no change in the status of our two operating satellites.

The demise of the Phase IIIA OSCAR has led some of my amateur friends to temporarily explore the progress of a number of commercial and military satellites following publication of articles in "Orbit" magazine submitted by Greg Roberts ZS1BI. Perhaps I should mention that "Orbit" magazine is published by AMSAT and is issued free to members of that organisation. (See my earlier notes for details of membership of AMSAT.) Although I would imagine Greg Robert's interest is primarily confined to satellites visible from South Africa, many of the satellites will have orbits within sight of Australia. Quite a number of these satellites operate in the bands 136-137 MHz, 149-150 MHz, 379-401 MHz and 460-480 MHz. He lists some 59 satellites operating in the 136-137 MHz band ranging from TIROS 5 which was launched in 1962, to NOAA launched in 1979, together with a number of Russian satellites operating between 149.9 and 150 MHz.

Charlie VK3ACR has already constructed a receive converter and has heard a variety of information from some of these satellites but as yet has been unable to decode either telemetry or pictures which are transmitted. I have no doubt his next phase will be to produce pictures, articles on which have been published in a number of amateur magazines. This is certainly a worthwhile interest to keep one's mind occupied until Phase IIIB is in operation.

Also in "Orbit" magazine for September 1980 is a list of satellites launched since the beginning of 1980. This quite impressive list includes 43 satellites — 12 American units and two Japanese, the remainder being launched from the USSR. The majority of the satellites are designed for military purposes but several are for navigation or communication and, judging from the orbital parameters, should be heard in Australia.

Perhaps the big problem facing the amateur is the diversity of the frequency of transmission — frequencies of which appear to range from VHF bands to SHF in the 30 GHz region.

Many amateurs have asked me what was lost when Phase IIIA failed and what is the cost of its replacement? I am sure it will be of interest to you to read the following article on spacecraft economics by Tom Clark W3IWI, President of AMSAT, and perhaps you can help in financing the satellites of the future.

WHO BUILT PHASE IIIA?

The word "built" has many facets. In general, the spacecratf was a joint project between AMSAT and AMSAT-DL. The basic design and architecture was the product of the technical arm of AMSAT-DL under the direction of Dr. Karl Meinzer, DJ4ZC, most if his group is affiliated with the University of Marburg. AMSAT-DL provided many of the spacecraft modules and sub-systems including the transponder, the attitude determination and control system including two of the sensors and their associate electronics and the computer-controlled electromagnet, the computer's memory, and many of the mechanical fixtures. AMSAT provided the flight computer with its analog multiplexer and command detector, antennas, one of the sun sensors, wiring harnesses and cables, a set of batteries and most of the "sheet metal" and mechanical fixtures. The second set of batteries came from France. One of the tow sets of solar panels came from AEG Telefunken through AMSAT-DL, and the second from SOLAREX through AMSAT (the flight configuration was three panels from each source). AMSAT arranged for the kick motor through THIOKOL. A group at the Technical University of Budapest under the direction of Dr. Bandi Gschwindt, HA5WH, provided the battery charge regulator module. AMSAT's Japanese affiliate, JAMSAT, provided the band-pass filter for the transponder. AMSAT's Canadian members provided a number of mechanical fixtures.

One more cost that should be included to assess the "worth" of Phase IIIA is the equivalent value of volunteer labor. About 4 of the 30 p.y. mentioned earlier came from salaried AMSAT employees who were already included in the $210,000. The remaining 26 p.y. was certainly "worth" the median US engineer's salary of about $23,000 per year, so the labor was equivalent to about $600,000.

★

Adding up all these figures we come to the conclusion that Phase IIIA was a $1,000,000+ satellite. This is the "worth" of what we lost on May 23.

★

WHERE DID THE $210,000 GET SPENT? WHY DID IT COST SO MUCH?

Again the ledgers provide the answers. The single most expensive item was salaries. Our favourite "pin-up girl", Marie Marr, and Clark Greene (K1JX) were on the AMSAT payroll for a total of about 3½ years. Perry Klein (W3PK) and Jan King (W3GEY) each accounted for about ⅓ year; however most of Perry's and Jan's efforts on Phase IIIA appear on the volunteer side of the ledgers. The total of these expenses was about $100,000.

The next most expensive set of expenditures was for real hardware. We note that the solar panels, including the honeycomb substrates totalled $28,100.

This estimate does not take into account the countless hours spent in planning for Phase III operations, or keeping the "business side" of the organizations functioning, or fund raising, or the time invested by the users in building their own stations, etc. If these had been included the totals would have been much greater. Of the AMSAT crew, about a dozen people were in the 800+ person-hour (p.h.) category (remember that 2000 p.h. = 40 hours a week for 50 weeks = 1 p.y.). Another dozen or so individuals made up the rest of the group we call the "hardcore" that delivered AMSAT's part of Phase IIIA. While I don't have the breakdown for AMSAT-DL or the Bundapest group, I'm sure that their distribution is very similar.

HOW MUCH MONEY WAS INVOLVED?

We have reviewed AMSAT's ledger and find the following figures for the Phase IIIA expenditures:

1977	$11,000
1978	43,740
1979	91,810
1980	62,840
Or, in round numbers	$210,000

Co-ordination meetings and telephone calls to get the command station network ready were a non-trivial expense. In my total for this category, I didn't even include any of the AMSAT-DL expenses, which were certainly comparable to AMSAT's.

The remaining $5000 in the total of $210,000 covered the myriad small expenses of outfitting the AMSAT-OSCAR Spacecraft Laboratory with workbenches, desks, tools, and even paint for the walls. Other miscellaneous expenses included in this figure were drafting supplies, office supplies, photographs, printing and other "business" expenses.

WHERE DID $210,000 COME FROM?

When a Life Member pays his $100 ($200 since July 1, 1980), or when a club joins as a Life Member Society, half the contribution goes into a Reserve fund. The interest derived from these reserves "pays" for the member's "Orbit" magazine and defrays some of the business office costs. These reserves also are used as security for long-term commitments and serve as a "cash-flow" buffer. The other half of the Life Member's donation is immediately earmarked for spacecraft construction activities. There were about 1500 Life Members on launch day, so their contri-

bution was about $75,000 (or 36 per cent of the total). About two-thirds of the Life Members reside in the USA, and the remaining third are well distributed around the world.

Members, users and supporters made contributions through our "sponsor a solar cell" program ranging from $10 for a solar cell or $100 for a battery cell, all the way up to $1000 or more to sponsor larger modules. After modest administration costs were deducted, this campaign raised about $50,000 (24 per cent). About 93 per cent of these donations came from the USA, Canada and Japan.

Another $30,000 (14 per cent) came from a couple of large individual US donors who prefer to remain anonymous. Other donors made contributions earmarked for the amateur satellite activities through the ARRL Foundation (ARRLF). When combined with original Eitel-Hoover matching Fund monies remaining in the ARRLF, and the interest derived from these funds, the ARRLF contribution totalled about $40,000 (19 per cent).

The remaining 7 per cent, or $16,000, came from a donation by the ARRL. When AMSAT agreed to work with the ARRL to provide OSCAR 8 as a "gap-filler" following the demise of the AMSAT-OSCAR 6 spacecraft, the ARRL made a donation of $50,000 to defray our costs and provide a stimulus for the Phase III program. AMSAT's actual out-of-pocket costs for OSCAR 8 were $34,000.

Substantial funds donated by International Amateur Radio Union (IARU), Region I (Europe and Africa), and various European amater radio societies were transferred directly to the AMSAT-DL organization and were not included in this summary of AMSAT's finances.

I'M NOT A LIFE MEMBER
I DON'T SEE MY DUES IN THE LIST OF CONTRIBUTIONS
WHY NOT?

When you consider the publications costs for the AMSAT Newsletter, or its replacement "Orbit", PLUS the salary of our Office Manager, Martha Saragovitz, PLUS the rental on the office, PLUS telephone, postage and other "business" expenses, your dues just "pay" for the services you receive. In fact, the recent dues increase was necessary just to pay the bills! If we get more advertising support for "Orbit", or if we can increase the sales of "Orbit" at the book-stands in local radio stores, or if we can ammortize the office expenses over more members, then some of your dues will go to support the spacecraft directly. I note that the "pie-charts" in the July 1980 QST (page 50) shows a similar picture for the ARRL; the member's dues do not cover all the services that the member receives.

WHAT IS AMSAT'S CURRENT FINANCIAL SITUATION?

We had planned all of our activities based on a successful Phase IIIA launch and these plans were thrown into a state of turmoil on May 23rd. We had made commitments to publish "Orbit" as a professional journal of amateur satellite activities. We had spent virtually all our resources (except for the Life Member reserves) on the "bird". The outpouring of sympathy following the launch failure was accompanied by a number of freewill donations. About 250 new Life Members signed up in time to beat the July - dues increase. We tightened our belts and cut our costs to a minimum (this is the reason that "Orbit" hasn't as many pages as we would have liked). With the concurrence of AMSAT's Board, I committed a major portion of the Life Member reserves to keep Jan King's salary for two years in order to keep him on AMSAT's "first-string" team. All this leaves us in the black through 1980 — but just barely!

This situation was not what we had planned for. Had Phase IIIA been successful, our anticipation was that the interest in the new scatellite would create a sizeable new membership base. We had to gamble all our resources on success — and we lost.

SO THINGS ARE TIGHT
WE LOST PHASE IIIA
WHAT WILL IT TAKE TO BUILD A REPLACEMENT?

The answer to this question depends on the details of potential subsequent launches: When? Who? Where? Jan and Karl are hard at work trying to secure a launch for a replacement Phase IIIB, but the verdict is not yet in. For planning purposes to generate an estimate of our requirements, we have made the following assumptions, which may or may not prove to be correct:

(a) Phase IIIB will be launched in the first half of 1982 on a non-US (e.g. ARIANE) launch vehicle.

(b) AMSAT will also be providing some support to the University of Surrey for UOSAT, with a launch scheduled in September 1981.

(c) The inflation rate is zero (!) and hence all monies are reckoned in terms of 1980 US dollars.

(d) Principal groups and their roles will be the same as for Phase IIIA. AMSAT-DL will arrange for their own funding which will support their activities.

(e) Phase IIIB will make maximum use of Phase IIIA technology and existing resources (e.g. the spare solar panels) will be used.

(f) Phase IIIB testing program will be more extensive than Phase IIIA.

THAT'S NEARLY $270,000
WHY IS IT MORE THAN PHASE IIIA?

First, inflation is taking its toll; the costs for travel have nearly doubled in the past year. Second, salaries will account for a third more than they did for Phase IIIA; I'll address this point later. Third, although the "hard-core" put out $30,000 for Phase IIIA, it would be unfair to ask them to do it again. Fourth, I've included a new category, "Interns", which did not appear in the Phase IIIA budget, again a point which I'll address later.

These factors all serve to increase the budget; they are offset by those elements which were not lost on May 23rd: We have a full set of solar panels on hand. The telecommand station network is intact and ready to go. If the launch configuration doesn't change too much, we have the spare sheet-metal spaceframe and its shipping container, and the wiring harness is nearly complete. And most important,

	July-Dec.	Jan.-June	July-Dec.	Jan.-June	Totals
Category	**1980**	**1981**	**1981**	**1982**	**By Category**
Salaries	17,000	39,000	39,000	39,000	$134,000
Capital Equipment	500	1,000	1,000	2,000	4,500
Components, sub-contracts, printed circuit board, painting, plating, etc.	3,000	12,000	18,300	5,000	38,300
Travel, telephone, telex, shipping, customs, etc.	4,700	6,000	7,000	19,500	37,200
Office supplies, postage, printing, photos, etc.	1,100	1,000	1,000	1,500	4,600
Telecommunication station, ground systems, computers, test equipment, etc.	1,000	1,800	1,500	3,000	7,300
Test expenses and contingency	0	2,000	5,000	10,000	17,000
"Intern" Program	4,000	7,000	7,000	7,000	25,000
Totals by ½ Year	**31,300**	**69,800**	**79,800**	**87,000**	**$267,900**

the team, and all the knowledge, skills and technology that they developed, is still intact.

WHY DO WE NEED SALARIED STAFF TO BUILD THE SATELLITES?

CAN'T VOLUNTEERS DO THE WORK?

Unfortunately, no. The need to interface our **amateur** activities with the **professional** aerospace community causes some unique problems. We must meet the professionals on their terms. This means that contacts must be made in the 9-to-5 weekday time window. We must show them that we are a responsible organization and this means that **they** must know how to contact **us.** We have to provide incredible volumes of documentation on the schedules that they lay down. Our principal contact must either have a benevolent employer who is willing to overlook (or perhaps even bless) the amateur activities, or AMSAT has to act as the employer. Up through OSCAR 8 and even in parts of the Phase III program, the volunteer mode was possible, but at the expense of the professional career development of some of the key individuals. These days now seem behind us. If the amateur satellites are to evolve from the "gee whiz" basement spectaculars into a long-term sustained service-oriented activity, then the handwriting is on the wall — the **amateur** satellite activities must themselves become **professional.** A nuclear staff of paid engineers, who have the responsibility to manage an on-going program and who interface the amateurs with the professionals, seems to be the only way.

The volunteer/amateur workers certainly have a place in the future activities. Their expertise, talents and energies will continue to produce the concepts and hardware. These "amateur" amateurs will draw on the services of the "professional" amateurs for those co-ordination tasks that they cannot do because of their need to earn a living during the daylight hours.

THE BUDGET SHOWS A LINE LABELLED "INTERNS". WHAT IS THIS?

The Intern Program is a new idea to provide a mechanism to educate the next generation of satellite builders and to transfer technology between the various AMSAT affiliates. The general idea is similar to hospital Intern training in the medical profession. A new doctor, fresh from school, decides to specialize in some field. He makes application to a teaching hospital which emphasizes his field of interest — perhaps neurosurgery. The intern learns by observing, lectures and eventually on-the-job training under the close supervision of the master. The intern also broadens his horizons by exposure to all the related fields. Although outside his specialty, the experiences learned in the Emergency Room taking care of the victims of a traffic accident will remain with him throughout his career. Coffee-room discussions on personal business management set in motion the ideas that, in future years, will allow him to accrue personal wealth. And the cameraderie engendered by personal contacts, both with masters and peers, will last him throughout his career.

Let us carry this analogy over to amateur satellite activities. The novice neurosurgeon becomes a young, eager engineer who wants to expand his horizons. He proposes to come work with the "masters" and in the course of doing so, both AMSAT and the individual prosper. Some fraction of the interns could be the future W3GEYs and DJ4ZCs; we **must** look towards the future by training our successors.

In a sense, we have already had some interns: Ron Dunbar (W0PN) spent several weeks during 1978 with DJ4ZC in Marburg, learning and understanding the IPS computer language and brought back the nucleus of the software that served the Phase III telecommand station network; Ron became our IPS "guru". Clarke Green (K1JX) and Ed Kaliin (K-RT) were detailed by the ARRL to assist with OSCAR 8 construction. Clarke returned to AMSAT as one of our key engineers in the construction of Phase IIIA. Will the next Jan King come from F, ZL, JA, or ZS? Only time will tell.

The modest funds in the budget to support interns are to cover per diem for living expenses and a limited amount of travel. If this program proves to be popular, AMSAT might find it expedient to have a "dormitory" in the form of an apartment convenient to AMSAT's laboratory. An allowance for this possibility has been included in the budget.

HOW CAN WE RAISE $270,00 OVER THE NEXT TWO YEARS?

The needs are clear ,but the solution will not be easy. The first $10,000 came in as "sympathy" offerings in June, but the river seems to have dried up. I want to thank Joe Schroeder (W9JUV) for his impassioned editorial pleas on our behalf in the July 1980 issue of "Ham Radio". In an article on page 45 of the July QST, Steve Place (WB1EYI) tells of what happened and answers many of the burning questions. I suggest that you all re-read these words and carry them to the rest of the amateur radio community. We need their help.

Dick Baldwin (W1RU), the General Manager of the ARRL, in his July 1980 editorial in QST told us to press on and persist. Contacts with Dick, Harry Dannals (W2HD), Jay Holladay (W6EJJ), "Chappie" Chapman (W1QV) and a number of other members of the ARRL "family" have now come to fruition. The ARRL Board, meeting in Seattle in July, passed two resolutions aimed at helping us. The first called on the ARRLF to establish a program to raise funds for the amateur satellite activities. The second authorized $10,000 as seed money for a matching fund campaign by the ARRLF. Additional seed money for the matching fund was committed by the Margaret W. and Herbert Hoover Jr. Foundation through Pete Hoover (W6ZH). **WE** — meaning both AMSAT and the ARRL — are hard at work to secure additional commitments for matching fund seed money. **YOU** can help. Your donations, large and small, will be matched dollar-for-dollar. All you need to do is write out a check to

The ARRL Foundation - Satellite Fund

and mail it to the ARRL, 225 Main Street, Newington, CT 06111.

Remember that $210,000 of your money for Phase IIIA made a $1,000,000+ satellite. The labor donated by the "hard-core", and the industrial and commercial donations matched every dollar with the equivalent of at least four dollars more. With the support of the matching fund, you now have the opportunity to make every dollar you give have the leverage of ten!

On the international front, we are seeing our colleagues raising their share. From AMSAT-UK and USKA (Switzerland) we hear of Phase IIIB fund-raising campaigns. The IARU Region I has made another commitment to AMSAT-DL. Substantial contributions have come from South Africa and New Zealand. Commitments have been received from our Japanese affiliate, JAMSAT. To the AMSAT membership I offer the following challenge — will **YOU** continue your support? Will **YOU** help to raise money? Will **WE** have a long-term, continuing program or will our loss of Phase IIIA have been in vain?" ■

THE VK3BWW FORMULA FOR DX SUCCESS!!

HIGH QUALITY AT LOW COST

BEAMS

3 EL 10 & 11m	**$66.00**
3 EL 15m	**$73.00**
3 EL 20m	**$145.00**
6 EL 6m	**$102.00**

DUOBANDER

3 EL 10m, 3 EL 15m **$135.00**

Prices include Gamma match

Our beams are easy to assemble and adjust. Entirely **NEW** CONCEPT — **NO** NUTS OR BOLTS.

Spare parts, elements, booms and gamma matches available.

Add $3.00 for Pack + Freight

For further information

PLEASE RING (03) 366 7042

VK3BWW

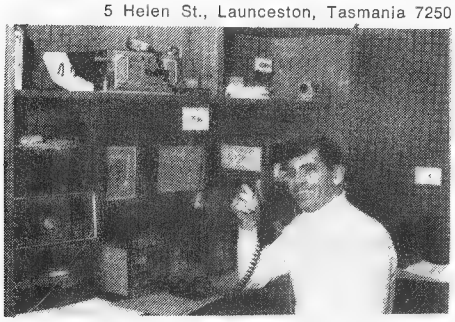
WERNER & G. WULF

92 LEONARD AVENUE

ST. ALBANS, VICTORIA 3021

SPOTLIGHT ON SWLing

Robin Harwood VK7RH
5 Helen St., Launceston, Tasmania 7250



Well, another year has come, and a new decade has commenced. What will happen during the next few months will be very interesting. Although the higher frequencies are still producing reasonable signals, they are starting to drop off to what they were in 1979-80. For example, the number of spurious second and third harmonic signals have decreased from the peak of observation 12 months ago. Also I have noticed that the European Long Path transmissions, particularly on 28 MHz, which I heard last summer, are very rarely observed now. However, transmissions above 14 MHz up to 22 MHz should still be satisfactory for Long Path observations over the summer period.

The period between the summer solstice (December 22nd) and mid-summer (January 15th) will provide numerous examples of the Sporadic E Propagation effects on the HF and VHF bands. Areas and regions that are not normally heard due to their close proximity, their signals bouncing over or skipping your area, will be noticed. The E layer is below the F layers, and is about 70 miles high. As can be inferred from its title, it is sporadic in nature, and usually observed when the ionization is at its densest, from late mornings to just after sundown. Transmissions are frequently up to a few hundred kilometres in distance, but occasionally longer distances of up to 5,000 kilometres, especially on transmissions above 30 MHz, have been logged during this period. You will notice that the signals will have a rapid fluttery characteristic similar to that experienced when an aircraft passes over and is between the transmitter site and your receiver.

The summer months will also see very good propagation on Short Path from Europe on bands above 14 MHz. Listen from 0900 GMT until 1300 or even later. There should also be signals from south-east US and Caribbean regions as well, from 1000 GMT to 1100.

However, there is another propagation path that is often overlooked. This is the **Polar Route,** over Antarctica. Those with beams could aim their antennas southwards from 0700 and also around 2300 GMT and listen. For example, RFE/R Liberty on 21455 and 25690 kHz respectively, can be heard without the constant jamming that is present on the Long and Short Paths. I wonder if there have been any experiments using this route on the amateur frequencies. I would be very interested in your observations on this.

The United Nations have designated this year as the **International Year of the Disabled.** As part of this, the two major international DX councils, **the European DX Council (EDXC)** and the **Association of North American Radio Clubs (ANARC),** have designated it **DXing FOR THE DISABLED** Year. Many of the major international broadcasters will also be enthusiastically supporting this with special programmes. The **Handicapped Aid Programme** is one organization that stands to benefit from this. HAP aims to promote and encourage the hobby to those who, being disabled, either have not been aware of the potential of this activity, or been prevented by the nature of their handicap from fully participating in it. I will hopefully have more details in the near future on what will be done here in Australia as part of the DXing for the Disabled Year.

Well, that is all for this month. In next month's column we will be looking at Band Charts. Until next time, the very best of DX and 73. ■

Ballarat Certificate

Here are details of a once only certificate which will be available for working stations in Ballarat, USA, and Ballarat, Victoria, on 30th, 31st January and 1st February, 1981.

A group of amateur enthusiasts from the Los Angeles (USA) area are planning an expedition, on 30th, 31st January and 1st February, 1981, to Ballarat in California. This Ballarat, in the Panamint Valley on the edge of Death Valley, is now only a ghost town of crumbling adobe walls. It was optimistically named, by an Australian, George Riggins, after the gold mining centre of Ballarat in Victoria. It was a rowdy supply town in the late 1880s for prospectors working claims in the Panamint Valley region.

Permission to have the expedition into the region had to be sought from various authorities, and could be a "once only" opportunity to work a station in that area. The significance between Ballarat, USA, and Ballarat, Australia, should also be considered. In the vicinity of Ballarat, USA, is also a town named Darwin, but I am uncertain if there is any historical connection between it and Darwin, Australia.

To commemorate the expedition, the Los Angeles amateurs have prepared a certificate for stations who contact them. To qualify for the certificate, stations are required to communicate with the station located at Ballarat, California, and must also communicate with TWO stations located in Ballarat, Victoria.

A large number of Ballarat, Victoria, amateurs will be active on various bands during this period, so contact with any of these two stations should not be difficult.

The expedition to Ballarat, California, will be using Collins KWM-2As, with 500 watt linear amplifiers, one for each band. Power will be provided from two gasoline generators for a total of 6 kW AC.

The organisers have planned the expedition in liaison with ARRL, and it is anticipated there will be an article in January 1981 issue of QST.

Summarising, to qualify for the certificate, stations must work:—

(a) **the Ballarat, California, station on any band;**

(b) **two stations located in Ballarat, Victoria, on any band; and**

(c) **during the period of 30th, 31st January and 1st February, 1981.**

The Ballarat, USA, station will use call sign **AB6C,** and use frequencies between **28100** and **28600** kHz, **21135** and **21370** kHz, **14275** and **14350** kHz.

Hours of operation will be from **0200Z on 31st January** until **1400Z on 2nd February, 1981.**

Calling stations will be given an identifier, which consists of the last two letters of the call sign of the Ballarat station contacted, plus a number.

Ballarat, Victoria, stations will use their own station call signs, followed by the word "Ballarat".

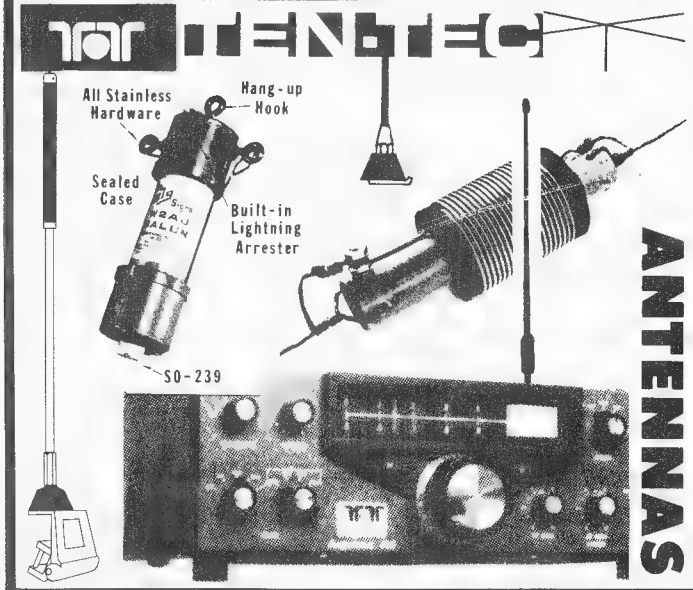
To obtain the certicate, forward your name, call sign, identifiers, address and return postage to **"Certificate", PO Box 425, Ballarat, Victoria 3350,** and your certificate will be on its way within a few weeks. This gives time to verify with the organisers in USA.

It does not matter which Ballarat you contact first. To qualify for the certificate you are required to contact the **Ballarat, USA, station,** plus **TWO Ballarat, Australia,** stations. ■

STOLEN EQUIPMENT

Kenwood TS520 S/No. 140610 with "SE" erased from "Send" switch and Kemtronic SWR meter. Anybody being offered this equipment contact police or phone King VK4ADS (07) 379 8245.

SCALAR — FOR THE DISCERNING AMATEUR



SC22DX	5 Band Vertical.....	$129.00
SC33DX	3 Band Beam.....	$270.00
W2AU	Dipole Balun.....	$34.50
REYCO	HF Dipole Traps.....	$43.15
INTERFILTER	Low Pass.....	$74.75
GSA46	6dB 70cm Colinear...	$100.65
GSA24	3dB 2m Colinear.....	$150.95
Y309	9 ele. 2m Yagi.....	$284.65
Y409	9 ele. 70 cm Yagi...	$155.25
DX-15	VHF/AM Splitter.....	$55.20
DELTA 580	Ten Tec Transceiver .	$994.00
ARGONAUT 515	Ten Tec QRP.....	$502.00
OMNI-D	Ten Tec Transceiver	$1340.00
SCA26T	2m Helical 5/8.....	$12.90

Please ask about our range of Marine and Commercial Antennas and accessories.

SCA21T	2m S/S Mobile.....	$4.15
SCA40T	70cm Gain Mobile.....	$13.10
SCA25T	2m 5/8 Mobile.....	$12.90
HA600T	6' HF Helicals.....	$39.70
C60	Trunkmount Base.....	$6.90
C54	Guttergrip Base.....	$17.25
MGB	Magnabase	$50.00
MB	VHF Mount.....	$3.65
OB	UHF Mount.....	$5.20
M27B	Heavy Duty Mount.....	$6.70
MS	S/S Mobile Spring.....	$9.10
MK	Knock-Down Knuckle.....	$9.60
HJA	Hemijusta	$9.50
INS-3	3" Porcelain Insul.....	$2.40

WORLD'S LEADING HAM BALUN
W2AU
the BIG signal®
MODEL OB UHF BASE.
(Patent 499, 636) Designed for correct termination of cable at UHF frequencies.
AUSTRALIAN MADE

Frank Welsh	VK3BPV
Mike Kilpatrick	VK2DJP
Ron Smith	VK2DCK
Brian Robinson	VK4NQG

Prices include Sales Tax. Freight from factory is additional.
Note that these prices are not applicable in W. Aust.

★ BANKCARD AND MAIL ORDERS WELCOME ★

SCALAR GROUP

NSW: 328 Kingsgrove Rd, Kingsgrove, 2208. tel: (02) 502 2888
VIC: 20 Shelly Avenue, Kilsyth, 3137 tel: (03) 725 9677
QLD: 8 Ferry Road, West End, 4101 tel: (07) 44 8024
W.A. Unit 5/319 Pearson St., Osborne Park, 6017 tel: (09) 446 4657

WIA 1981 SUBSCRIPTIONS

These are the WIA subscription rates for 1981. If you believe you have not received a subs notice please pay the rate shown for your grade (see your AR address label coding) and Division. Please pay direct to the Executive Office, Box 150, Toorak, Vic. 3142.

	$	Grades
VK1	25.00	All
VK2	24.00	F
	22.00	A
	24.00	C
	22.00	T
	14.00	G
	18.00	S*
	14.00	Family
VK3	30.00	F
	28.00	A
	30.00	C
	28.00	T
	18.00	G
	18.00	S*
VK4	22.00	F
	22.00	A
	22.00	C
	22.00	T
	18.00	G
	10.00	S*
	10.00	Family
VK5	26.00	F
	25.00	A
	25.00	C
	24.00	T
	18.00	G
	13.00	S*
	14.00	Family
VK6	24.00	F
	23.00	A
	24.00	C
	23.00	T
	18.00	G
	13.00	S*
VK7 (all zones)	24.50	F
	24.50	A
	24.50	C
	24.50	T
	14.90	G
	14.90	S*

* Subject to authentication.

Grade ceilings are:—
F — Full City.
A — Associate City.
C — Full Country.
T — Associate Country.
Divisional Council).
S — Student.

Family members for States not listed will be appropriate grade less $8.10 in respect of AR element (i.e. for VK3 a family member without a call sign would pay $19.90). ■

WICEN

R. G. HENDERSON,.
Federal WICEN Co-ordinator,

171 Kingsford Smith Drive, Melba, ACT 2615
Ph. (062) 58 7904

WICEN provided a HF link from Perth to Canberra for a 6 hour period during the Annual Natural Disasters Organization (NDO) National Emergency Operations Centre exercise COMCOORD 3. The link on 14 MHz passed traffic by RTTY and SSB. The Perth station VK6WIE, located in the Metropolitan Regional HQ of WA SES, Mt. Hawthorn, was manned by Don VK6DY, Fred VK6FH, Glen VK6IQ, Syd L60206, the WA WICEN Co-ordinator, and Arthur L60213, his assistant Co-ordinator. The Canberra station, VK1WI, was located at the QTH of John VK1FT and was manned by John and Ron VK1RH, the Federal WICEN Co-ordinator.

During the period one SSB and five teletype messages were received from Perth and two SSB messages sent, thereby demonstrating the radio amateur's ability to contribute to emergency communications.

ABBREVIATED PROCEDURE

Following recent discussions with VK2BMM of NSW WICEN I offer the following suggestions on abbreviated procedure.

We take our guidance on procedure from Civil Defence and military publications to ensure inter-operability. This suggests two levels of abbreviation when conditions are good, e.g. FM repeater nets, and traffic dense with a minimum of formal messages. The first level involves omitting pro-words and call signs as in the following example. Full acknowledgement to an instruction **"VK1WI this is VK1RH ROGER OUT".**

Abbreviated response **"ROGER OUT".**

Please note that as identifications, e.g. call signs, are only necessary at ten minute intervals this is a valid action even on a training exercise.

The second level, which has been tested in NSW and ACT on very busy nets, is to replace the response with just the call sign. Furthermore, where abbreviated call signs are authorised they can be used; so the abbreviated response to the example becomes:—

"VK1RH"

or with abbreviated call signs "1RH" or "RH" (as authorised). Readers will notice the similarity with air traffic control procedures.

THIRD PARTY TRAFFIC AND THE HANDBOOK

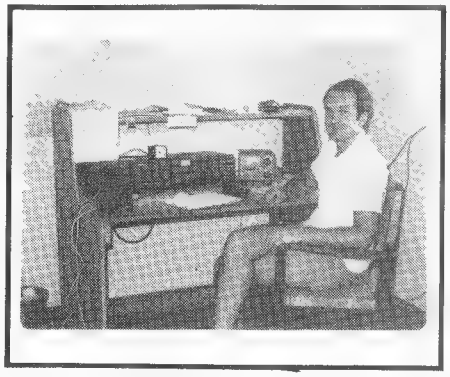
The Federal Executive in their dealings with the Department of Communications are following up the implications of third party traffic privileges, WICEN and the Handbook regulations. ■

YOU and DX

G. (Nick) Nichols VK6XI
6 Briar Place, Ferndale, WA 6155.

CONSIDER DXCC

Is it really the achievement it used to be? Judging by recent contests the only possible answer could be NO! In 24 hours on a single band, considered to be unreliable DX-wise, I counted a total of 112 countries with workable signals. Oh yes, you say, but try getting QSLs out of them — in my opinion that's hardly the point as provided your pocket is deep enough and the postal pixies blind enough the cards will be forthcoming — but chasing QSLs hardly says anything about your



VK5RP at Government House, Brunei.

operating skill, patience and general efficiency of your station. Work 100 mobile, all CW or QRP — well, that's a different matter entirely, but perhaps it is time to review this award in the light of the enormous improvements in technology. Do black boxes,, linears and computer designed triband yagis, coupled with the tremendous upsurge in amateur activity world-wide, make the award meaningless — think about it — isn't it time consideration be given to scrapping it? Replace it with a DX200 certificate — that at least would start to reflect an achievement.

On the other side of the coin "Worked All Zones Award" — and we don't have one available within VK???? — is, I consider, an achievement worthy of a piece of "wallpaper". To obtain it 40 zones covering every corner of the globe are required — sounds easy doesn't it — trouble is invariably 2 zones, no matter what part of the world you live in, are difficult and at times seemingly impossible to hear, let alone work. Here in Western Australia Zones 2, 12 and 40 cause us problems; I gather VK2s have much the same trouble with 2 and 40, but find 12 relatively easy, whilst finding 34 is a real problem (a push-over for the VK6s).

Think about it, check your tallies, if you agree drop me a line and we'll see what can be done to get an award for this achievement going here.

COUNTRIES LIST

No, I haven't yet got down from my soap box, just what is the definition of a "Country"? A non-amateur asked me that after seeing one of our "countries lists" — now after having spent many hours pouring over a huge atlas looking for our "countries" I begin to wonder if the dart board method was used. Sand bars in the Caribbean (wet feet at high tide), nature reserves — you name it and we call them countries. On the logic currently employed Tassie, Rottnest, Kangaroo Island, etc., should be hurriedly put forward as "new ones". Yes, it sounds stupid but unfortunately it's true. World authorities acknowledge the existence of only 198 countries — that's only 121 less than us; if we split England into G, GI, GW and GM, surely then good old oz is entitled to 8 different (?) countries? Amateur radio is non-political, well it's supposed to be! And yet we give separate country status to provinces within a country, provinces that virtually disappeared decades ago; International Law accepts a 200 nautical mile economic zone surrounding each country (provided it's not land-locked) — surely then any island within such a zone and belonging to that country should not be classed separately. Logical? Well then on my calculations EA6, VE1 Sable would be automatic deletions and there are several others which raise other queries — in particular Jabal at Tayr — it's in the middle of the Nile basin; Abu Ali, well, that seems to belong to Saudi Arabia and it's only about 20 miles off the coast (it takes some finding, 27.20 N 49.33 E), but probably the most ironic situation of the lot is Antarctica — it classes for amateur radio as 7 zones, covers an area of 13,338,500 square kilometres (a larger area than Europe), it cannot be crossed without, to say the least, a major exercise in logistics and yet is ONE DXCC country. With sandbars, lighthouses and monasteries all rating separate mention, it really makes you wonder!

FACT AND FICTION

There are many rumours on the bands concerning the granting of a licence by 3X authorities to LA5KC — fingers crossed but don't get your hopes up too high.

Kermadec activity is also heavily tipped possibly this month — no call signs known at this time, but it looks promising.

ON THE BANDS

10 Metres:

Solar flare activity knocking it around but really fine propagation at times. On CW, Europe is thumping in at good strength, HS1AMX and KH3AB rate a mention, the latter, being newly licensed in November, promises plenty of activity CW-wise on all bands 8-10.

On phone W6QL/SV5, EA9EO, KH3GB/KH3, HZ1AB, VO2CW, 8Q7KK, 9N1MM, JT1AN, G3JKI/5A, CN5AMV, CN8DF, A9XCX, FP8HL and YK1AA were available for the patient 10 metre fanatic.

15 Metres:

Solid but remarkably quiet, it seems a neglected band at present, but for those who did give it some attention, on phone CX3BBH, G3JKI/5A, HC1HC, HC8GI, CE0AC, HK0EHM, HK0FBF and PJ2FR.

On CW VS5RP, VQ9NN, FO8EW, 7X2MB and KG4KK were heard on several occasions.

20 Metres:

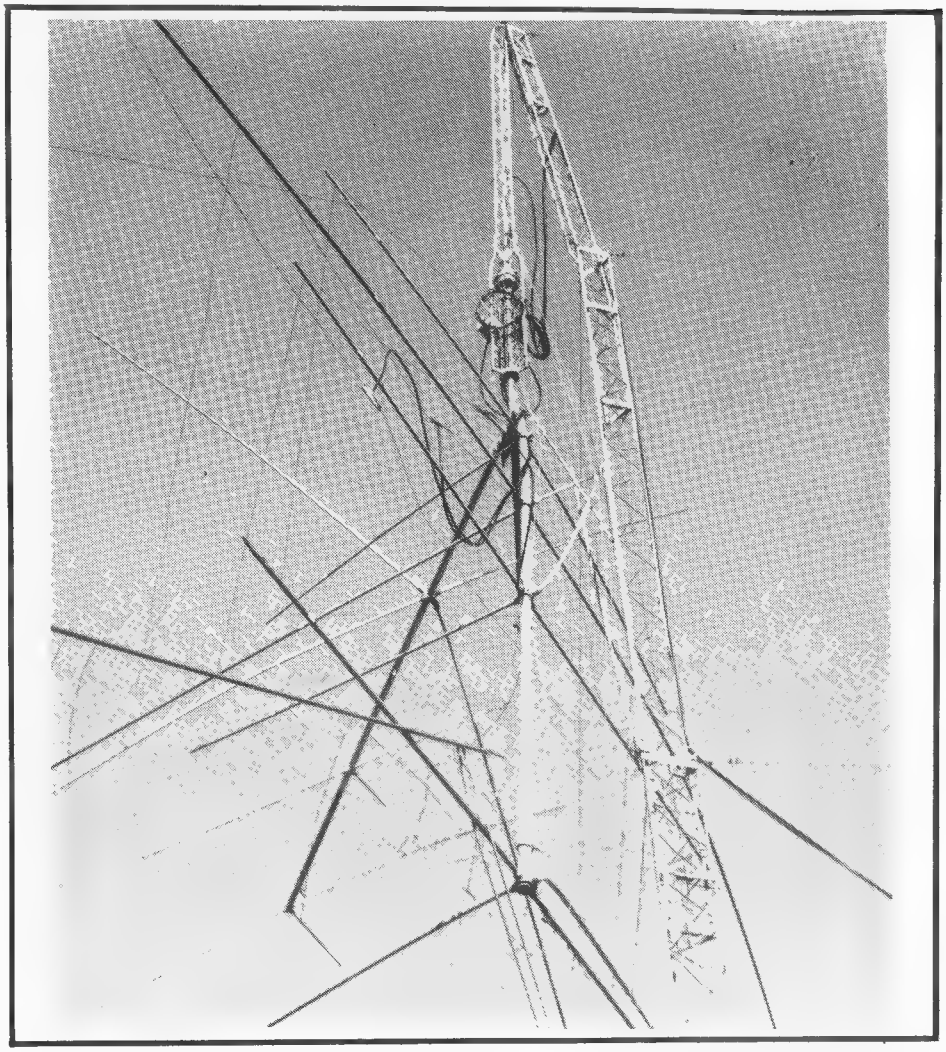
The QRM gets depressing but as always alive with DX, on phone ET3PG, FM7BX, FY7AN, PY0OD, PY0ZDX, 8Q7KK and FB8ZO and on CW HH5VP and TU4AW.

40 and 80 Metres:

Nothing much of real interest except 8Q7KK on both phone and CW, plenty of Ws and Europeans but 80 remains patchy.

QSL INFORMATION

HZ1AB — via K8PYD.
PY0OD — via WA4MDS.
YK1AA — via DJ9ZB.
8Q7KK — via W2FV.
W6QL/SV5 — via Yasme Foundation.
G3JKI/5A — via F6CYL.
WB4ZNH/5X5 — via K4PHE.
CN5AMV — via PO Box 22, Arabat, Morocco.
CR9B — via WA3HUP.



In my November column I mentioned that my tower and quad had come to grief. Every picture tells a story.

For QSL information you are having trouble pinning down, try the East West/North South DX information net — Mondays, 28.560, commencing 2000Z, call in with your problem or obtain the very latest DX information broadcast, usually at 2130Z. Net co-ordinator is KD8MR or occasionally a W7.

Best 73s. Nick. ■

QSP

RST

Ham Radio September 1980 editorial picks up earlier comments in other amateur magazines that the antiquated RST signal reporting system, valuable in the early days of amateur radio, is in need of revision. One suggestion is that there might be a simple three tier reception report based approximately on (a) no copy at all, (b) partial copy, or (c) full copy as the case may be. Such a system is suggested as helping to reduce on the air pollution in today's amateur bands. "Goodbye to the QSL hunters 5 and 9+ when he has had to get you to repeat your call sign several times!" ■

JOIN A NEW MEMBER — NOW!

NOTES ON THE PREDICTIONS

The mode of propagation used by IPS in compiling their predictions are reflected in the bar charts used to convert the Graflex symbols into a graphic picture.

When generating the Graflex charts (reproduced in a number of publications) the following symbols are used.

1. "." — Propagation is possible but probably less than 50% of the days of the month.
2. "%" — Propagation is possible between 50% and 90% of the days of the month.
3. "F" — Propagation is possible by the first F mode on at least 90% of the days of the month unless there is a severe ionospheric disturbance.
4. "M" — Propagation is possible by both first and second F modes. The strongest mode is normally the first mode, but the vertical aerial pattern may influence the mode received.
5. "A" — High absorption, i.e. above the absorption limiting frequency but probably too close to it for good communication.
6. "X" — Complex mixtures of modes including the second E mode.

These are the most significant types we encounter. The full lines or bars on the chart cover 2, 3, 4 taking 5 into account. The broken lines or bars are depicted by 1. 6 is extremely hard to verify and is not taken into account.

The paths from Eastern Australia are based on Canberra. The paths from West Australia are from Perth. Suitable allowance should be made on Eastern paths for geographical differences. Times, as much as 1 hour difference between Victoria and Queensland in band openings occur. Often there is no signal available in one State, whereas the opposite effect occurs in the other State, they get the lot. Marginal differences produced by layer tilt and varying degress of ionisation can be very frustrating.

Generally the predictions show that time of day when the path should be open between the two areas. All other factors notwithstanding. ■

A Call to all holders of a

NOVICE LICENCE

Now you have joined the ranks of Amateur Radio, why not extend your activities?

THE WIRELESS INSTITUTE OF AUSTRALIA
(N.S.W. DIVISION)

conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a SUCCESSFUL CONCLUSION.

For further details write to:

THE COURSE SUPERVISOR, W.I.A.

P.O. BOX 123,
ST. LEONARDS, N.S.W. 2065

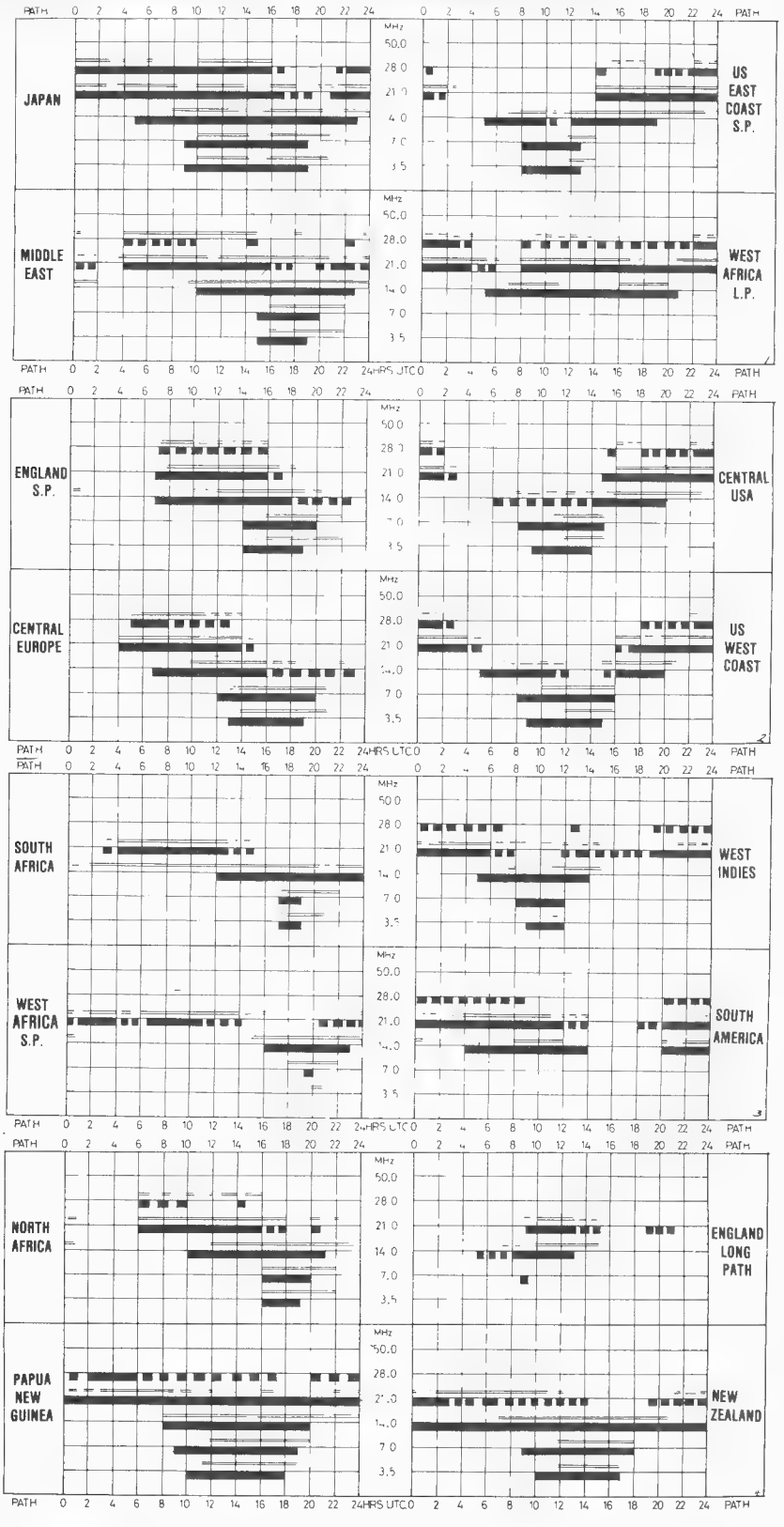
Photographs for AR

DON'T KEEP THEM TO YOURSELF

Send them in – NOW

IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE



Predictions courtesy Department of Science and Environment IPS Sydney.
All times universal UTC (GMT).

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

The Editor,
Dear Sir,
We wish to thank all of the people in the WIA who have worked over the last three years for the successful removal of the long standing prohibition on the use of third party traffic by amateur radio operators in Australia, as announced recently by the Minister of Posts and Telecommunications.

As a result, a National Third Party Amateur Radio network has been formed and the following participants have asked to have their thanks registered:— VK2DGK, VK2VTN, VK2NSZ, VK2VW, VK2DNO, VK2BVS, VK3CCH, VK4PK, VK4ARZ, VK5DC, VK2BRI, VK2CBC.

73s. Sam Voron VK2BVS. ■

17 Willis Street,
E. Victoria Park 6101, WA
15th October, 1980

The Editor,
Dear Sir,
In AR (October 1980) VK4SS raised some interesting points re the VK/ZL Contest, but he seems to have missed the point of what a Contest is really all about.

Let us have maximum participation by all means, but do not let us forget that a Contest is, or should be, a competition between communicators to prove who is the most proficient in passing ACCURATELY basic pieces of information, viz., Call Sign, RS(T) 01 (001), etc. Of course DX location, Antenna, Power, etc., all have some bearing but 1979 VK/ZL results show some of the Novices did pretty well with their low power and multi-element Monobanders on 10 and 15. Unfortunately some people try to operate a contest like a DXpedition and try to get the most information, correct or otherwise, down on paper in the stipulated time. As a Communications Expert (Journalist) VK4SS must see this is not communicating.

Even a Log Sheet is a communication, and must be legibly written, and to present an illegible scribble is a discourtesy for, after all, the pay received by the Contest Log Checkers ($ NIL) is rather poor so why be discourteous to someone who is trying to help out. I cannot understand his thinking in that a fixed cypher would be an improvement. For if VK6 sends 29 as a cypher and VK2, 3, etc., send 30, what is the point of a cypher Nearly everyone gives 59 (or 599), so all a contest would become would be an exchange of Call Signs, until some silly honest clot told the bloke he was 3 by 3. Now a real improvement, to confuse the opposition, would be to start at 01 (001) on each band worked. Why not? A separate log is required for each band.

As for saying mistakes do occur, well if there is a mistake made in receiving a cypher correctly no communication has taken place, so the contact should count for nil score. Accuracy is the name of the game. ZL is to be commended for insisting this year the exchange "be acknowledge" DX to DX working would wreck our contest. If proof is needed just try making a score in one of the European Contests like the Scandinavian Activities Contest. The only Europeans we would work would be the ones looking particularly for us.

Multi-Operation Section must be a NO NO. If 10 VKs all get together to work one Call Sign then the DX participants would immediately be robbed of the chance of 9 more QSOs with VK.

Finally my pet hate in the CW section of a Contest is the "Communicator" who has his Bug Key, or Electronic Keyer, set too fast for his operating capability. These coves would very quickly earn "LID" from one of the old time Telegraphists.

Hope I have been able to communicate.

H. D. Spence VK6FS. ■

PO Box 109, Mt. Druitt, NSW 2770
30th September, 1980

The Editor,
Dear Sir,
"Brick-bats" to all those people who made the recent VK Novice Contest the non-event of the year!

The VK2 Division of the Institute paid scant attention to what I believe used to be a very enjoyable bash. The WIANEWS broadcast in this State carried only the time/date and "details may be had from AR for ' .... .', 1979. End of Item.

Not having the particular issue, I made numerous enquiries (to no avail). Finally contact was made with Eric VK2ATZ/VLX (Westlakes Radio Club), three hours into the contest. He apparently spent most of his on-air time explaining the rules. Thank you, Eric.

Many stations on air were completely oblivious to the fact there was even a competition! And some of the comments heard are unprintable, both from Novice and Full Calls alike, because of those **"Blanky NOVICES"** in the contest.

To the YLs, who incidentally scored well, congratulations, and to all those that made contact with me in the contest, thanks. It was a real pleasure to talk with you all, from ZL-P29-VK.

If the Institute wants the support of Novices in this country, then how about supporting the Novices. We make up **considerable** numbers in the books.

73. Colin Stevenson VK2VVA. ■

AWARDS COLUMN

Bill Verrall VK5WV
7 Lilac Avenue, Flinders Park, SA 5025

I guess I had better head this month's column my "COMPLAINTS DEPARTMENT'.

During last winter I decided to try for some of the awards I have described in this column over the last couple of years. I have done quite well and now have collected about twenty new pieces of wallpaper. However I am somewhat disappointed in the way some of the awards have been prepared and mailed. Some have arrived with the details written thereon by hand. Others have been inadequately packed and arrived in a semi-mutilated condition.

If your Club is prepared to spend a considerable sum of money to have awards printed, why not spend a little more to provide your awards manager with a marking stencil and perhaps some good quality envelope or mailing tubes (ex Post Office). At least type on the details rather than write in by hand. If I hand wrote the details on our WIA awards, I would be faced with a massive rejection rate!

In January 1979, the rules for all WIA awards were amended to permit GCR certified lists in lieu of forwarding QSL cards with applications. This saves a lot of my time and considerably reduces postal expenses for both the applicant and the WIA. I prefer to receive certified lists for checking rather than a heap of cards, but there are a few comments I think necessary.

Please submit your DXCC lists in country order as they appear on the WIA or ARRL official DXCC countries list. For each application I have to make out a master record in country order, and it is time-consuming to continually flick from one column/page to another for GCR lists that are not in the right order.

Ensure that each list contains the six bits of essential QSO/QSL information as in WIA DXCC rule 4.3. I still receive lists without the QTH shown and, recently, one without the signal report. I will continue to reject incomplete lists.

When listing the QTH, I am only interested in the **country** as shown on the official DXCC lists and the QSL, not the town within the country. For example, list Australia not Sydney, and USA not Los Angeles, etc.

It is not sufficient for the QSL to contain a call sign only. The QTH must also be indicated on the card. I have rejected quite a few QSLs from overseas countries in the past few months because the card contains no indication of QTH other than a call sign. Return these to the sender and complain or throw them in the WPB and try to work another as I do.

See rule 4.2, the card must **not** be altered. I tend to be somewhat more liberal than perhaps the ARRL would be but I have rejected cards where call signs have been altered and/or alternative QTHs written thereon. Recent examples are QSLs from 5NOSID and FROFLO.

If you are asked to check and certify a list for a friend, and you have any doubt about a card, do not become bad friends! Send the card along with the application and I will have a look at it.

Thoroughly check the card against the list submitted. I've had recent examples of obvious errors (or I like to think so), e.g. cards that I have seen before and know that they are altered, a country claimed when every DXer knows that there has been nil activity at the time specified, claimed QSOs and presumably a QSL from unauthorised operations and duplications where the list is not in country order.

If there is any doubt about a QSL card, send it along with the list. You should also include those in the "don't know" category, as I can usually work out most cards received, particularly from the USSR. If I am not sure of a card, I will reject it and ask for more info or recommend that you try and work another station from the particular QTH

Don't be too perturbed if I ask for two or three cards for examination. This is usually to satisfy my curiosity because of some previous knowledge and/or information about the operation.

Try to keep an accurate record of credits you have already received for the WIA DXCC. I occasionally receive duplicated claims for updating the records but usually under a different call sign. I will always return your original list with any comments noted thereon so you may keep your own records accurate.

If I reject a QSL and you are not happy with my decision, by all means query it. I have changed my mind a few times over the past couple of years, mainly because of errors made in my own records.

AWARDS DIRECTORY

I recently received a copy of the book "Amateur Radio Awards", second edition, published by the RSGB. This book contains the rules and some illustrations of the principal amateur radio awards available from most countries to overseas operators. I recommend that all serious award hunters obtain a copy and it is available from "Magpubs", PO Box 150, Toorak, Victoria 3142, for $7.10 plus postage, or, by the time you read this, copies should be available from some of the Divisional Publications Officers.

CORRECTIONS

The following corrections should be made to the DXCC listings included in this column in the September 1980 issue:

1. DXCC — TOP LISTING, PHONE:
   Read VK5MS 318/359
   VK3AHO 294/326
2. DXCC — NEW MEMBERS, PHONE:
   Certificate No. 227 was issued to VK5NVW, Tally 106.

DXCC NOTES

JD — OKINO — TORISHIMA. This country was deleted from the DXCC listings on 1st December, 1980. Therefore only contacts made from 30th May, 1976, to 30th November, 1980, inclusive will count for DXCC purposes. All DXCC tallies are being progressively amended accordingly.

H5, S8 and T4. Please note that these homeland states of the Republic of South Africa do **not** qualify as separate DXCC countries nor are they likely to be approved in the foreseeable future. Therefore all QSL cards submitted with these prefixes will be credited as RSA (ZS).

Good hunting. ■

Index to Volume 48 — January to December 1980

ANTENNAE

An 80 Metre Vertical .. Feb 16
Simple Antenna Coupler .. Feb 6
A Two Element Quad for 28 MHz .. Mar 10
Try This (Simple Elliptically Polarised Antenna) .. June 31
Putting Up the TH3 Jnr. .. June 22
A Multiband Antenna System Evolved from the Junk Box .. Aug 9
How Your Favourite 2m 5/8 Wavelength Antenna Doesn't Work .. Aug 8
Taming the Multi-Element Quad .. Sept 14
Dirt Cheap Direction Finding .. Oct 10
Delta Yagi — The Answer? .. Nov 11
Practicable Mobile Antennae .. Nov 8
The Ten-Turn "Chopstick" Helical — A High Gain Antenna for Satellite Work Dec 8

☆

RECEIVERS

Commercial Kinks (FT75 and FT227R) .. Jan 29
Some Improvements for the Eddystone 888A Receiver .. Jan 20
Adding RIT to the FRG-7 and other Receivers .. Mar 18
Modifications to the Kyokuto VHF Transceiver .. Mar 27
Try This (Using a Second Receiver) .. Mar 29
A Cure for Unwanted High Level Mixing with the TS600 .. Apr 12
An On-Air Monitor for SSB .. May 10
Dirt Cheap Direction Finding .. Oct 10
Weather Satellite Converter .. Oct 12
Further Thoughts on the Kenwood R1000 Dec 19

☆

COLLECTORS' CORNER

The ICOM IC280 .. July 25
The Yaesu FRG-7 .. Aug 25
The SX200 Scanning Receiver Monitor .. Oct 25
The ICOM IC260A/E 2m All-Mode Transceiver .. Nov 21

☆

TRANSMITTERS AND TRANSCEIVERS

Replacing that Unusual "JA" Transistor (Amp. Mod. to Kyokuto 2 Mx Tcvr.) .. Jan 15
A Five Band VXO for the FT75 .. Mar 21
A 40W 432 MHz Linear Amplifier .. Apr 8
Modifications to the Weston HF1000 Transceiver .. Apr 28
Novice Notes (Peak Envelope Power Measurements) .. Apr 36
The DJ4LB ATV Transmitter as a Basis for a 70 cm SSB Transverter .. Apr 16
More on the DJ4LB ATV Transmitter as a Basis for a 70 cm Transverter .. June 26
Modifications of SSB 27 MHz PLL Transceiver for 10m Operation .. Aug 11
Two Metre Linear Amplifier with a Difference — using a QQE 03/20 .. Aug 16
Circuits Mods to the Kyokuto Transceiver for Handicapped Operation .. Sept 12
Five Watt CW Transmitter (Afterthoughts Nov 5) .. Sept 8
Portable 2m Repeater .. Sept 20

☆

MISCELLANEOUS TECHNICAL

Inexpensive High Impedance Multimeter Jan 9
New Developments for the Morse Enthusiast .. Jan 17
Sunspot Cycle 21— To Date .. Jan 26
The Even Simple Regulator .. Jan 12
Calculation of Great Circle Distances .. Feb 14
Another AF Filter .. Mar 28
Pointing Antennae with Microprocessors May 6
A Spectrum Scanner .. June 11
Audio Activated Saturated Switching .. Aug 15
High Impedance Buffer and Broadband Amplifier for Digital Multimeters .. Oct 8
Project Asert — VHF Propagation between Albany and Adelaide 1979-1980 .. Dec 11

☆

CONTESTS

John Moyle — Field Day Rules .. Jan 27
Commonwealth Contest .. Feb 33
RD Contest Results 1979 .. Feb 26
VK-ZL Contest Results 1979 .. Apr 44
VK-ZL Oceania DX Contest Rules 1980 .. May 15
VK-ZL Contest 1979: Foreign Results .. June 34
Remembrance Day Contest Rules 1980 .. July 42
A Look at the John Moyle Field Day Contest 1980 .. Aug 30
John Moyle Field Day Contest Results 1980 .. Aug 7
Results of the 1979-1980 Ross Hull Contest .. Sept 40
1980 RD Contest Opening Address (A. A. Staley, Minister P & T) .. Oct 7
Commonwealth Contest 1980 Results .. Nov 36
Remembrance Day Contest Results 1980 Nov 34

☆

GENERAL

Amateur Radio Satellites — An Opportunity for Education .. Jan 21
CW and Redundancy .. Jan 16
Electronics — Its Part in My Downfall .. Jan 18
Sunspot Activity Increases .. Jan 40
WIA Federal Videotape Library .. Jan 28
WIA 1980 Subscriptions .. Jan 28
CARE (Community Amateur Radio Events) Feb 17
Hooray — For None of the Above .. Feb 20
Western Zone Convention .. Feb 20
A Peep into the Past .. Mar 29
AR Awards .. Mar 14
Binding Contest Logs .. Mar 16
Data Transmission and How Computers Do It .. Mar 19
Ron Wilkinson Award .. Mar 14
Winnie the War Winner .. Mar 20
World Administrative Radio Conference — Geneva 1979 .. Mar 7
How Much Current Can Your Heart Tolerate .. Apr 27
Observations of a Beginner in Amateur Radio .. Apr 26
Pick of the Pics from VK6 .. Apr 34
What is Amateur Radio .. Apr 13
The Severity of an Earthquake .. Apr 32
Amateur Radio and the Public .. May 22
QRP CW — Let's Give It a Shot in the Arm .. May 20
WICEN in Victoria .. May 19
A Decade on VHF in Review — 1 .. June 12
Putting Up a TH3 Jnr. .. June 22
Quo Vadis .. June 35
The Static Electricity Syndrome .. June 21
The WIA in VK2 .. June 20
VK CW QRP .. June 29
A Decade on VHF in Review — 2 .. July 17
Amateur Radio for the Cruising Yachtsman 1 .. July 10
OSCAR for Beginners .. July 24
The 1980 Federal Convention Report .. July 35
Amateur Radio and the Cruising Yachtsman 2 .. Aug 20
Do It Electrically .. Aug 24
QSL? .. Aug 7
Satellite Solar Illumination .. Aug 14
She's a Beaut Mate .. Aug 23
The Emergency Net .. Aug 22
Cycle 21 Peaks .. Sept 35
Repeater Quiz .. Sept 18
We are not Pirates .. Sept 13
Amateur Radio Weekend .. Oct 30
Artificial Satellites .. Oct 38
JOTA 1980 .. Oct 30
Mobiling in the American and Canadian Rockies .. Oct 14
Oxley Region Amateur Radio Club .. Oct 24
The Value of Wireless Telegraphy .. Oct 19
Why ASCII? .. Oct 21
Writing an Article for Amateur Radio .. Oct 13
Youth Radio Clubs Scheme of Australia Oct 41
An Open Letter .. Nov 10
Teletext in the UK .. Nov 34
The Unusual Hazards and Dangers of Radio .. Nov 26
WICEN Exercise for North Western Zone Nev 13
A Bit of Victorian History .. Dec 13
A Man and His Hobby — VK3ACR .. Dec 12
Chinese Study — Amateur Radio .. Dec 32
Margaret, 70, Becomes Amateur Operator Dec 22
New Zealand's New 2m FM Repeater Bandplan .. Dec 27
Queensland Amateur Radio Display .. Dec 28
The Royal Navy Amateur Radio Society, Past and Present .. Dec 26
Rally II — WICEN Exercise .. Dec 24
The Physics and Chemistry of Fire .. Dec 29
World Wide Communications from Hand Held and Manpack Transceivers .. Dec 16

☆

EQUIPMENT REVIEWS

The SX100 Scanning Receiver .. Jan 25
FT207R 2m Transceiver .. Feb 11
The R1000 General Coverage Receiver .. Feb 8
The Ten-Tec Omni D Series B Transceiver .. Aug 17
The Icom IC2A 2m Hand Held Transceiver .. Sept 16
A Review of the IC720 HF Receiver .. Dec 2

☆

BOOK REVIEW

Weekend Projects for the Radio Amateur Aug 47

☆

NOVICE NOTES

NOVICE NOTES
Peak Envelope Power Measurement .. Apr 36
A Bit of Psychology .. May 24
Building Your First Project .. Aug 32
The Work Area .. Aug 32
Tools Required .. Aug 33
Soldering .. Aug 33
More Useful Tools .. Sept 23
Scavenging .. Sept 24
The Short Vertical Antenna (Ground Plane) .. Oct 31
More on the Ground Plane .. Nov 17
Amateur Call Signs .. Nov 19
Phonetics .. Nov 20
Buying a Second-Hand Transceiver .. Dec 34

THE FIVE-YEAR INDEX (1976-1980) WILL BE PUBLISHED IN FEBRUARY, 1981

AROUND THE TRADE

NEW TEN-TEC TRANSCEIVER

Scalar Industries announce the introduction of the Delta 580 HF transceiver from Ten-Tec.

The new Delta is a fully solid state unit providing 200 watts input on **all** bands from 160m through 10m (including the new WARC allocations). Frequency readout is provided digitally by 6 red LED numeral displays providing accuracy to 100 Hz. Broadband design of the 580 provides instant operation on all bands with no tuning needed.

Other features of the 580 include an 8 pole monolithic SSB filter, built-in notch filter variable from 200 Hz to 3.5 kHz, offset tuning, optional noise blanker, hang AGC and a unique SWR meter. Also included is adjustable threshold ALC and DRIVE, adjustable sidetone level and vernier tuning typically 18 kHz per revolution.

The Delta is capable of being powered from a 13.8V DC source for mobile use or may be used with an optional 117/240V AC supply.

For further information on the Ten-Tec Delta contact Scalar Industries, 20 Shelley Avenue, Kilsyth 3137, or telephone (03) 725 9677. Sydney (02) 502 2888, Brisbane (07) 44 8024 or Perth (09) 446 4657. ■

RAPID BATTERY CHARGER

Vicom International Pty. Limited, Australasian representatives for Redifon Telecommunications of United Kingdom, have a new rapid nicad battery charger which cuts down the time taken to charge these batteries from several hours to around 20 minutes. Charging can be done irrespective of the state of charge of the cell or its operating temperature and is done in complete safety. This new charger is directed to users of portable radio equipment using rechargeable nickel cadmium cells. The charger can be used as part of a planned maintenance programme to recondition nicads which have deteriorated through repeated slow charging.

The disadvantage of some rapid chargers lies in the fact that permanent damage can be done to a battery if the critical areas of temperature and pressure are exceeded towards the end of the charge period. On the other hand trickle chargers impair the general condition of the batteries and produces a progressive degredation in battery performance and rated power capabilities.

The Redifon system will charge a battery in less than 20 minutes from a fully discharged state and in safety, up to 95 per cent of the nominal capacity and avoids critical areas of temperature and pressure.

The system improves the condition of a battery even when it has been subjected to slow charging cycles, and will compensate automatically for battery initial temperature and state of charge.

The system relies upon the adoption of a pulse charging principle, which allows a high charge to be stored in a short space of time. It is this pulsing process that also improves the cell condition. A built-in microprocessor recognises a large change, in one specific cell parameter, which can vary as much as 600 per cent from the partial to the fully charged state. This wide range means that each charger can be individually programmed to operate right up to a full 95 per cent charge level and yet to cut out safely before internal gasing can occur. Indication is given when this charged state is reached.

Further details, prices and availability can be obtained from Vicom International Pty. Limited, 68 Eastern Road, South Melbourne. Phone 699 6700. ■

QSP

SHORT WAVE LISTENERS

A new, well printed monthly magazine in English, entitled "Voices — The Guide to International Broadcasting", has been received. It includes details, times and frequencies of broadcasts in English and other information of interest to the avid listener. Subscription rates, valid to 30th September next, are $A15 for one year, which includes airmail postage. The address is "Voices, PL226, SF-00171 Helsinki 17, Finland". ■

NEW ZEALAND

Break-In of September 1980 includes statistics showing there are 5,532 amateur licences issued in ZL, of which 25 are Novices and 1,696 are equivalent to our Limited calls. The membership of NZART is shown as 2,898 of the total licensees — 52 per cent — in a total of 77 branches. In this copy of Break-In there is also a letter from their administration confirming that ZLs will continue to be permitted to use the 7.1 to 7.3 MHz segment of 40 metres on a strictly non-interference basis to broadcasting services.

W. GERMAN LICENSING

Radio Communications, October 1980, "Marth on the Air" column contains some interesting details about West German licensing.

"From 1 June, 1980, a new class of licence has been made available in West Germany. It is designed to provide a transition from the Class C to the Class B and is called the Class A. Class C is VHF only, and the new Class A allows the use of the telegraphy modes (CW and RTTY) in the sub-bands 3,520-3,600 kHz and 21,090-21,150 kHz, with a peak RF output of 150W, as well as all permitted modes on all frequencies above 28 MHz. Class A stations will use the DH prefix followed by a single digit and three-letter suffix. The Class B licence allows all modes on all bands with peak RF output of 750W — except on the West German allocation 1,815 to 1,835 kHz where the power output may not exceed 75W. The prefix blocks DF, DJ, DK and DL followed by a number and two-letter suffix are almost exhausted and will be followed by the DL prefix, single digit, and three-letter suffixes. The VHF-only Class C licence holders use the DA4, DB, DC, DD and DG prefixes. It is interesting to note that at the time of writing over 85 per cent of West German amateurs are members of their national society." ■

ALARA

AUSTRALIAN LADIES' AMATEUR RADIO ASSOCIATION

There were six members at the November meeting. Mavis VK3KS, the Awards Manager, announced 22 ALARA awards have been issued. Please apply direct to Mavis, QTHR, for your award; this will speed up your receipt of it.

Congratulations to **Dawn** VK3VJH of Gunbower. New call is VK3DCW. Dawn has been on air about a year now and is looking forward to meeting girls on next activity day. Her OM is studying for novice call.

Narelle VK3NMV. Narelle lives at Bamawm. Full call pending. She has been active on 10m for two years on SSB, also 10m and 80m CW.

Rae Boyle VK3VUK, Echuca. Rae passed theory and sending CW in August, sitting CW receiving in November.

Marilyn VK3VUA, Irymple. Novice call in June, limited call in August. Marilyn is very active in Mildura Radio Club.

Congratulations to other girls who have passed exams, won contests, etc.

Please let me know if you have received any awards, or anything of interest to ALARA.

Tentative arrangements for next meeting at Bendigo, 21st February. This is the weekend of Midland Zone Convention (Sunday 22nd). Please keep this date in mind. We would love to see as many as possible, Come for the week-end, meet the Executive of ALARA and also you may have something to contribute for ALARA's continuation. Plans are to run ALARA on an Australia-wide level with State branches.

Please come and help the small group of girls who have kept **our** Association going. We need new members to keep increasing the strength of our group and also foster amateur radio among YLs.

Enquiries re joining ALARA to **Daurel VK3ANL, PO Box 110, Blackburn 3130.**

Publicity to **VK3DML** (VK3NHD, QTHR).

73/33. Margaret VK3DML. ■

State Convention 1981

The Wireless Institute of Australia Victorian Division State Convention will be held at Latrobe University, Glen College, Bundoora, 3083, between February 28 and March 1, 1981.

The convention will commence on the Friday evening with an informal social at 8 p.m. This will allow country visitors to meet their city counterparts. Saturday and Sunday functions include trade and industry displays, educational displays, ATV demonstrations by Rod VK3ZLW, Peter VK3BFG and the Melbourne ATV group and a live eye roving camera using a 10 GHz link!

Competitions will include Best Homebrew Item, Foxhunts, radio throwing contest for the ladies, antenna gain measuring contest and a guess the resonant frequency and capacitance contest.

The venue for the State Convention features full accommodation and catering facilities, lecture theatre, display areas, social facilities and car park set in an attractive open air parkland.

The cost of registration for the weekend is $10 ($5 for YLs). For other charges please refer to a registration form.

Registration forms are obtainable from the WIA Victorian Division Office, 412 Brunswick Street, Fitzroy 3065.

All Victorian amateurs are urged to attend this worthy event and in doing so ensure success of this Convention, organised on behalf of the Amateurs in the State. ■

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means address is correct as set out in the WIA 1979 Call Book.

FOR SALE

Icom IC-255A, in exc. cond., 25W FM Tcvr., digital readout, 2 VFOs, multi-purpose scanning, simplex/duplex/reverse operation, 5 memory channels, low power position 1W, complete with mic., mounting bracket, handbook, $325. Arthur Solomon VK3LJ, 130 Ballarat Road, Creswick 3363. Ph. (053) 45 2031.

Yaesu FT101Z HF Txcvr., plus YO148 mic., exc. cond., one owner, $720, ONO. John VK3VUW. Ph. (03) 309 3737.

Tower, 5 sections each 6 ft. x 9 in. x 1¼ in. verticals, this tower can be seen erected (30 ft. plus fixing pipe), fully galvanised, price $110 as is (help provided). VK3YTC, QTHR. Ph. 878 2229 AH.

Kenwood TS120S, inc. mic. and service manuals, plus 13.8V 25A homebrew power supply, $750; will separate. Bert VK3YTJ. Ph. (03) 758 4086 AH.

Can't get out on 2m? Try this one, 16 element phased array with 9m UR67 coax; yes it does look like a TV antenna, $45. Ph. (02) 604 7137 after 8 p.m.; buyer must pick up.

Wind-up Tower, galv., 100 ft., $500; TH3JR, $75; AR22L rotator, $75; Kenwood TS 120V with cradle, $550; Robot model 70A SSTV monitor, $300; Lin Wearne ex VK4NES, QTHR. Ph. (075) 33 1172.

Icom IC701 and power supply, $900; High Gain 6 el. monoband 10m yagi, 24 ft. boom, $200; High Gain 5 el. monoband 15m yagi, 26 ft. boom, $250; many other extras. VK2NBB, QTHR. Ph. (02) 602 3368.

Linear Amp. Parts — 4CX250Bs $10 ea.; new SK620/SK606, $25; new SK600 $20; HV PSU parts, incl. transformer, $60; twin blower unit $20. VK4ZRQ, QTHR. Ph. (07) 343 5139.

UHF Signal Generator, Marconi TF1066/B2, 400 to 555 MHz FM, $340; Icom 701 txcvr., $790; Digitech TTY distortion analyser and test word generator, all solid state, $80. VK1VP, QTHR. Ph. (062) 49 2764 or (062) 49 6348 AH.

ALBANY

LOCKYER LAUNDRETTE

32 SOUTH COAST HIGHWAY
(Off the Roundabout)
7 WASHERS and 4 DRYERS
Support a Local Amateur
VK6NQ

WANTED

RF Amplifier AM-4306/GRC, originally used in conjunction with AN/PRC 25 set. VK8CO, QTHR.

TS 120V FT7 or similar, any cond., must be cheap. VK4AYZ. Ph. (077) 43 5785 or PO Box 1015, Mt. Isa Qld. 4825.

Yaesu FT200 Txcvr., complete, will exchange almost new BWD 509B 10 MHz oscilloscope. VK4NUY, 14 Cooradilla Street, Jindalee 4074.

Type 3 Mk. 2 Tx-Rx, also want old morse keys. VK5DL, QTHR. Ph. (08) 277 2155.

Beg, Borrow, or Buy: Grob's handbook on television. An old edition, mainly or entirely on black and white TV sets would be suitable. A. Renton VK7RE, 51 Penquite Rd., Newstead, Tas. 7250. Ph. (003) 44 3044 or 82 1953.

Pair 6LQ6/6JE6C Tubes for TS900 Tcvr, or any information as to their availability would be greatly appreciated. Stan Rigney VK2BRZ, QTHR.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. G. A. LANE	**VK5CV**
Mr. L. W. JOHNSON	**VK3YF**

OBITUARY

George Lane VK5CV passed away suddenly on 5th October, 1980. A great number of Australian and overseas amateurs will miss Charlie Victor on all bands, both SSB and CW.

As a retired General Motors employee he was always active in the "Firebird World Amateur Radio Club" and did much to assist others in the amateur field.

His son Maitland VK5AO is well known for his activity on Amateur TV and indeed joined the amateur ranks before his father did so in 1961.

The many who knew George would wish to tender their condolences to his wife and family in their loss.

Rob Wilson VK5WA. ■

SHUTE HARBOUR

MOTEL
& Licensed Dining Room
SHUTE HARBOUR, Q. 4800
PHONE (079) 46 9131
DAVID McINERNEY

27/3.5 and/or 7.0 MC Transverter, Dick Smith Design or similar, price and particulars to VK2JS, QTHR. Ph. (02) 412 1508.

Urgently, Unconverted Hi-Band Set in going order for bush fire brigade use. Rob VK2ZZX, Ph. (062) 36 9271.

TRADE HAMAD

Amidon Cores — Iron-powder and ferrite, enlarged range available for tuned/wideband and supression applications in Rcvrs./Trans., large SASE for data/price list. Closed for business during November. RJ & US Imports, Box 157, Mortdale, NSW 2223.

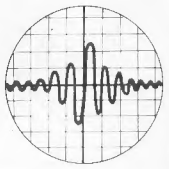
MOE

CODLIN COMMUNICATIONS
84 ALBERT ST. (051) 27 4516
Everything for the Amateur
KEN VK3DKC BRUCE VK3VRE

ADVERTISERS' INDEX

AUDIO TELEX	44
AMATEUR RADIO ACTION	42
BAIL ELECTRONICS	43
CW ELECTRONICS	16
DICK SMITH ELECTRONICS	2
CFS	6
NSW DIVISION WIA	38
SCALAR INDUSTRIES	35
SIDEBAND ELECTRONIC ENGINEERING	27
VICOM PTY. LTD.	4, 7
WILLIAM WILLIS	30
W. & G. WULF	33

IF YOU'RE NOT BUYING
AMATEUR RADIO ACTION



(IT'S AUSTRALIA'S BEST SELLING AMATEUR MAGAZINE)
THEN YOU'RE NOT KEEPING UP WITH THE LATEST NEWS, VIEWS AND REVIEWS

Please put me down for 12 editions of Amateur Radio Action, starting NOW!

Rates In Australia - $14.40 Surface mail overseas - $18.40 Air mail: To New Zealand - $A28.70; Malaysia - $A32.60; Japan - $A38.45; USA - $A42.35; UK - $A46.25

Herewith enclosed cheque/postal note/money order to the value of:

$A.....

Name.....

Address.....

.....

.....

Postcode.....

Post to: Amateur Radio Action Subscriptions, Box 628E, Melbourne 3001.

YAESU THE RADIO

Introduces the ultimate professional general coverage, all mode Communications Receiver, FRG-7700

- **GENERAL COVERAGE**

The model FRG-7700 is a high-performance, all solid state, communications receiver designed to cover the low, medium and high-frequency spectrum from 0.15 MHz to 29.999 MHz.

- **ALL MODE CAPABILITY**

A unique feature of the FRG-7700 is its all mode capability — SSB (USB, LSB), CW, AM, and FM. The FM mode is especially useful when the FRG-7700 is teamed with a VHF converter.

- **DIGITAL FREQUENCY/TIME DISPLAY**

The FRG-7700 digital display unit allows you to display the operating frequency or time. Just turn a knob for selection of the desired function.

- **TWELVE MEMORY CHANNELS (OPTION) WITH BACKUP**

As many as twelve memory channels may be programmed for instant return to a favourite station. The memory unit stores the entire frequency, which means you never have to change the bandswitch when switching channels. A backup feature is provided to hold the memory circuits when the FRG-7700 is turned off.

- **LSI CLOCK TIMER**

If you want to record a program, but have to be away from your station, the FRG-7700 will do it for you. The built-in digital quartz clock contains a timing feature that activates the receiver and internal relay contacts. Set the time you want to start and stop recording, hook up your tape recorder, and your FRG-7700 will do the rest.

- **WIDE DYNAMIC RANGE**

The FRG-7700 is an up-conversion superheterodyne receiver, incorporating a 48 MHz first IF. The up-conversion technique and the individual filter networks in the front end eliminate most image problems, allowing you to receive weak signals. A high "IDSS" JFET balanced mixer is utilized in the FRG-7700 to provide wide dynamic range for protection from cross modulation.

- **CONVENIENCE FEATURES**

Selectable AGC, memory fine tuning, DIM switch for dimming the digital display, advanced noise blanker, and a variable RF attenuator provide the convenience you need for efficient operation. The front panel controls and switches are arranged in a logical manner, so you won't have to fumble for a knob when you need it quickly.

Call or write for a coloured brochure.
Mail orders are despatched within 24 hours of receipt of your order.

(Subject to availability from stock.)

YAESU

ELECTRONIC SERVICES
STAN ROBERTS VK3BSR
38 Faithful Street,
WANGARATTA 3677
Telephone: (057) 21 6260
Telex: Teletra AA56880

AUTHORISED DISTRIBUTORS

VICTORIA
CHIRNSIDE ELECTRONICS.....(03) 726 7353
CODLIN COMMUNICATIONS (Moe)...(051) 27 4516
G.F.S. ELECTRONICS.....(03) 873 3939
IMARK.....(03) 329 5433

N.S.W.
EMTRONICS.....(02) 398 6378
INVERELL.....(067) 22 1300
WAGGA WAGGA.....(069) 21 2125

QUEENSLAND
C.W. ELECTRONICS.....(07) 341 5377

S.A.
COMPUCOM PTY. LTD.....(08) 43 7981
FARMERS RADIO.....(08) 293 2155

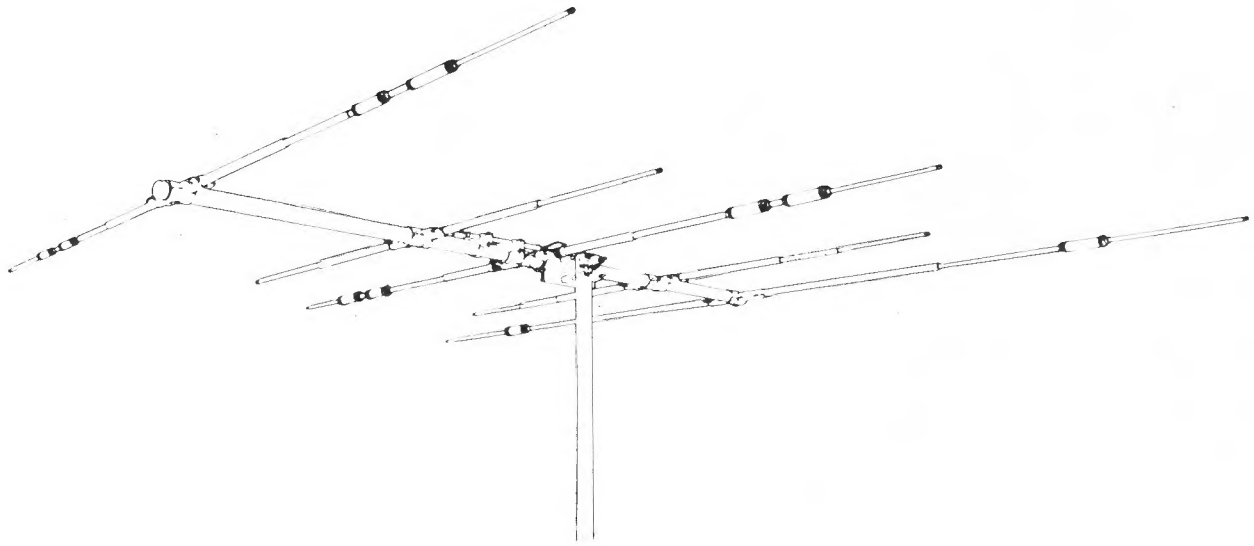
W.A.
PATCOM COMMUNICATIONS.....(095) 35 4592

TASMANIA
HOBBY ELECTRONICS.....(002) 43 6337
V. K. ELECTRONICS.....(004) 31 1708

And other regional centres.

hy-gain®
DIVISION OF TELEX COMMUNICATIONS, INC

TH5DX
10-15-20 METERS



We are proud to introduce the newest member of our famous Thunderbird line of Tri-Band antennas. The TH5DX offers outstanding performance on 20, 15 and 10 meters. It features 5 elements on an 18 foot boom, with 3 active elements on 15 and 20 meters and 4 active elements on 10 meters. The TH5DX also features separate air-dielectric Hy-Q traps for each band. This allows the TH5DX to be set for the maximum F/B ratio and the minimum beam width possible for a Tri-Band antenna of this size. Also standard on this antenna are Hy-Gain's unique Beta-match, rugged Boom-to-mast bracket, taper-swaged elements and improved element compression clamps.

Boom length	18 feet	VSWR at resonance	less than 1.5:1
Longest Element	31 feet	Power Input	Maximum Legal
Turning Radius	18 feet	Input Impedance	50 ohms
Surface Area	6.4 sq. feet	−3dB Beamwidth	66° average
Wind load	164 lbs	Lightning Protection	DC ground
Weight	50 lbs	Forward Gain	8.5dB
		Front-to-Back Ratio	25 dB

WRITE OR CALL FOR A FREE BROCHURE AND THE NAME OF YOUR NEAREST HYGAIN DEALER
SOLE AUSTRALIAN DISTRIBUTOR

AUDIO TELEX COMMUNICATIONS
PTY. LTD.

hy-gain electronics
DIVISION OF TELEX COMMUNICATIONS, INC.

MELBOURNE:
7 Essex Road,
MOUNT WAVERLY 3149
Tel: 277 5311

BRISBANE:
394 Montague Road
WEST END 4101
Tel: 44 6328

SYDNEY:
1 Little Street,
PARRAMATTA 2150.
Telephone 633 4344